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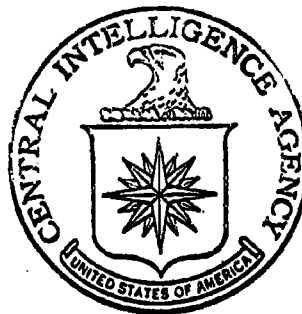ARLINGTON HALL STATION
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SCIENTIFIC INFORMATION REPORT

CHINESE SCIENCE

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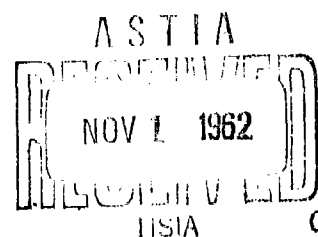
SCIENTIFIC INFORMATION REPORT

Chinese Science (12)

     This is a serialized report consisting of unevaluated information prepared as abstracts, summaries, and translations from recent publications of the Sino-Soviet Bloc countries. It is issued in six series. Of these, four, Biology and Medicine, Electronics and Engineering, Chemistry and Metallurgy, and Physics and Mathematics, are issued monthly. The fifth series, Chinese Science, is issued twice monthly, and the sixth series, Organization and Administration of Soviet Science, is issued every 6 weeks. Individual items are unclassified unless otherwise indicated.

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<u>BIOLOGICAL AND MEDICAL SCIENCES</u>

ON DIVISION OF NERVE CELLS -- Peiping, Kuang-ming Jih-pao, 20 Sep 62, p 1

Embryologists Prof Hsu T'ien-lu (6079/1131/4389) and Lecturer Hsu Ching (1776/7234) of Chung-shan Medical College in a recent article pointed out that there is a very close relationship between nerve cell mitosis and an increase in glycogen and that the addition of large accumulations of glycogen in the cortical substance is the principle cause of mitosis. In the course of their experiments, they removed portions of the cerebral cortex from white mice and within 2 weeks observed the existence of large quantities of glycogen in the cerebral cortex. When the glycogen content reached a maximum, nerve cell mitosis occured. When the glycogen diminished and disappeared, mitosis stopped. At the same time they observed that the location of maximum mitosis generally was the area of maximum distribution og glycogen.

Contrary to beliefs held heretofore, Scviet and Chinese scientists have, in the past few years, observed that the nerve cells of the sympathetic nerve nodes, the intestinal nerve plexus, the bone nerve nodes, and the cerebellum and cerebrum cortex are capable, under certain conditions, of dividing and reproducing.

INTERCELLULAR NUCLEAR PHENOMENA EXPLAINED -- Peiping, Kuang-ming Jih-pao, 10 Sep 62, p 1

After several years of research, Chinese botanists Shu Ch'eng-hou (2422/2052/0683) and Wu Su-hsuan (0702/4790/5503), avoiding the harmful effects resulting from the preparation of slides, were able to observe the activity of intercelluar protoplasm in living bodies, as well as the physiological mechanism of the movement. The results of their experiments enabled them to recognize regularities in the intercelluar movement of the protoplasm.

The observations also revealed the fact that a good deal of cellular material moves between the cell walls, even although the cell nucleus remains in a fixed position. This activity can be suppressed by the use of moderating agents, although it may reappear with the disappearance of the agent. The conclusion that the activity of the protoplasm is self-initiated may therefore be drawn. Other vbiochemical analyses have demonstrated that the activity of protoplasm in higher and lower plants is similar, and that it derives its energy from the contractibility of the protein used.

CYTOLOGISTS DISCUSS NEW ACHIEVEMENTS -- Peiping, Kuang-ming Jih-pao, 9 Sep 62, p 1

The Zoological Society of China and The Botanical Society of China recently held their first joint cytology conference in Peiping. It was attended by 67 cytologists from 43 units. Forty-six papers were submitted covering various aspects of cytomorphology, cytophysiology, cytochemistry, and radio cytology. New achievements were made in such fields as the reporduction patterns in animal and plant cells, mitosis and amitosis, intercellular migration of the nucleus, and the evolution and physiological functions of the cell organ.

Two papers entitled "Research on the Structure of the Nucleus in Cell Interphase and the Outward Movement of the Nucleolus" and "Research on Amitosis and the Vacuome" proved the important significance of reproduction through amitosis and the relationship between the vacuome and the Golgi body with the yolk granule, and also discussed the hypothetical question of the outward movement of the nucleolus within the cell.

Two other papers entitled "Mitosis of the Cerebral Nerve Cells" and "The Relationship Between Nerve Cell Mitosis and the Glycogen Content" refuted the claim that nerve cells having undergone a high degree of development and differentation no longer are capable of reproduction, a claim accepted internationally for many years.

In the field of plant cell research, two papers proved that the occurence of the intercellular movement of protoplasm in higher plants is closely related to the physiological state and functions of the tissue, thereby clarifying the question of the past several years between man-made psuedophenomenon and physiological phenomenon in relation to intercellular movement.

Several papers were read which dealt with research on animal and plant cells making use of such processes and materials as tracer atoms, ionizing radation, supersonic waves, cortisone, and 666.

Four items in particular were discussed by the conferees. They concerned cell submicrostructure, tissue culture, cytochemistry, and the nucleus and cytoplasm. In discussing the relation between the nucleus and cytoplasm, attention was centered on amitosis, the structureless nucleus in interphase, and on the theoreticeal question of whether it is possible to reject the claim that chromosomes are continuous in as much as the nuclear structure cannot be seen in interphase.

SOCIETY OF ANATOMY HOLDS ANNUAL CONFERENCE -- Canton, Chung-kuo
Hsin-wen, 7 Sep 62, p 4

The third annual congress of the Chinese Society of Anatomy
was held from 28 August-2 September in Shanghai. The conference
consisted of the description and discussion of the results of re-
search in various aspects of anatomy in the past several years.
Workers from all parts of the country presented a total of 281
papers. They included studies of gross anatomy, neuroanatomy,
histology, embryology, acupuncture and moxibuxtion, oncology, etc.
They were treated from the standpoint of research in traditional
anatomy and histology, observations in experimental anatomy, func-
tional condition, in vitro tissue culture of brain cells, and
observation of blood vessels in organs. Some of the research paper
results were obtained through the application of new technology
such as organic chemistry, tissue culture, X-rays, and the
electron microscope.

The conference also discussed the future development of var-
ious aspects of anatomy, exchanged experience in teaching anatomy,
and elected a board of directors. The new board of directors is
composed of 25 persons, with Chang Yun (1728/9462) as chairman
and Wu Ju-k'ang (0702/3067/1660) as vice-chairman.

FINDS SUBSTITUTE FOR ANTISERUM IN STUDY OF BACTERIOPHAGE -- Peiping,
Shih-yen Sheng-wu Hsueh-pao (Acta Biologiae Experimentalis Sincia),
Vol 7, No 3, Jun 61, pp 199-201

[The following is an abstract of a research paper,
"Study of the One-Step Growth Curve of Bacteriophage
Without Using Antiserum," by Ts'ai I-ch'uan (5591/1355/
2938) and Kao Shang-yin (7559/1424/5593), Wuhan Micro-
biological Laboratory, Chinese Academy of Sciences.]

By way of introduction, the authors state that the latent per-
iod of a virus refers to the shortest time between its initial
adsorption to a host cell and the final bursting of that cell with
the liberation of daughter viruses. The burst size of a virus strain
refers to the average number of daughter viruses that are liberated
by each infected cell. These two characteristics of a virus can be
determined by the one-step growth curve method proposed by E. Eliss
and M. Delbruch in Journal of Gen. Physiol., 22: 365-384, which
method calls for the use of "costly" antiserum.

The present paper reports the results of experiments undertaken to study the feasibility of using [6,9-diamino-2-ethoxyacridine lactate, Merck], a product of Bayer in Germany which is sold under the name "Rivanol", as a substitute for antiserum.

Comparing the growth curve of Shigella flexneri bacteriophage determined by using antiserum with that determined by using Rivanol (40 microgram/cubic centimeter), the authors found no significant variation in latent period but a great difference of more than 200 in burst size. They point out that other investigators have reported burst size differences of similar dimensions for one strain of bacteriophage [using antiserum], and conclude that the use of Rivanol as a substitute for antiserum in studying the one-step growth curves of viruses merits consideration.

In conducting the present experiments, the authors reportedly were investigating the replication of bacterial viruses in host tissues -- a part of a larger research project on bacteriophages which was being carried out in their laboratory. They had the help of Yu Lan-fen (0151/5695/5358) in the technical work.

The paper was received for publication in January 1961. (FOR OFFICIAL USE ONLY)

TITRATION OF INFLUENZA VIRUS -- Peiping, Shih-yen Sheng-wu Hsueh-pao, Vol 7, No 3, Jun 61, pp 203-206

[The following is an abstract of a paper entitled, "Titration of Influenza Virus -- Comparison of Tissue Culture and Hemagglutination Methods," by Hsieh T'ien-en (6200/1131/1869), Wuhan Microbiological Laboratory, Chinese Academy of Sciences.]

A method is presented for the titration of influenza virus in monolayer chick embryonic lung tissue culture. The results obtained by this method are compared with those obtained by the hemagglutination method. The tissue culture method is recommended because of its greater dependability despite the fact that it gives a lower titer.

The following persons helped with the experiments: Ch'eng Ch'ao-pin (4453/2600/1755), Hsu Ching-lin (6079/7234/3829), and Huang Hsueh-ming (7806/1331/2494). (FOR OFFICIAL USE ONLY)

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TWO NEW STEROIDIAL HORMONES PUT INTO MASS PRODUCTION -- Peiping,
Kung-jen Jih-pao, 6 Sep 62, p 1

This year, the Shanghai T'ung-yung Pharmaceutical Plant
(T'ung-yung Yao-ch'ang; 6639/3938/5673/1381), has greatly in-
creased production of two new sterioidial hormones, "Ch'iang-
ti-sung" and "An-t'i-shu-t'ung."

The production of "Ch'iang-ti-sung" has been trebled in the
past 8 months. This hormone is an improved variety of cortisone,
three to five times stronger than its predecessor. The drug is
used in the treatment of rheumatic arthritis, and the symptoms of
rheumatism and rheumatic anaphylaxis.

"An-t'i-shu-t'ung" is used to reduce excessive sodium and to
insure the proper amount of potassium in the blood. Neither hormone
has appreciable side affects.

EFFECT OF SARCOLYSIN ON MOUSE TUMORS STUDIED -- Peiping, Shih-yen
Sheng-wu Hsueh-pao (Acta Biologiae Experimentalis Sinica), Vol 7,
No 3, 1961, pp 185-196

[The following is an abstract of a paper entitled,
"The Inhibitory Effect of Sarcolysin on Mouse Tumors," by
Ku Kuo-yen 7357/0948/1750), Lu Chia-hung (0712/1367/7703),
and Hu Chao-ch'ing (5170/0340/1987), Institute of Experimen-
tal Biology, Chinese Academy of Sciences.]

The authors cite a previous paper, "Report on Enhancement of
the Therapeutic Effect of Sarcolysin," which they coauthored with
P'eng Su-fen (1756/4790/5358) of their institute, in the Peiping
journal, K'o-hsueh T'ung-pao, [No 3], 1960, pages 90-91. It re-
ported experiments which demonstrated that the carcinostatic effect
of sarcolysin could be enhanced by dissolving it in dilute HCl
solution.

The present paper gives the details of controlled experiments
in which more than 450 white mice which were bred in the authors'
institute were used to investigate the correlation between such
enhancement and the intact state of the sarcolysin molecule and also
to elucidate the mode of action of the acid-dissolved sarcolysin as
it inhibits the growth of Ehrlich ascitic tumors.

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The sarcolysin was donated by the Shanghai Research Institute of the Medical Industry (Shang-hai I Kung So), [presumedly an abbreviated form of the name "Shang-hai I'yao Kung-yeh Yen-chiu-so"]. The mice were implanted with various types of tumor cells and then experimentally treated with one of three sarcolysin preparations: sarcolysin dissolved in physiological saline at 50° centigrade, sarcolysin dissolved in dilute (0.005N) HCl, and acid-dissolved and neutralized sarcolysin.

The carcinostatic effects of the sarcolysin preparations were compared against their liberation of Cl+ ions. Their effects on the energy metabolism, radiophosphorus metabolism, and division of tumor cells were carefully observed.

It was found that sarcolysin was relatively stable in dilute HCl but very labile in physiological saline, liberating Cl+ ions. Its carcinostatic effect diminished with the loss of Cl+ ions. On the other hand, it was demonstrated that the enhancement of the nitrogen mustard compound's carcinstatic effect was not due to the low concentration of HCl or to biological variation in the experimental mice, but due to the fact that the sarcolysin molecule remained intact in 0.005N HCl.

It was demonstrated that the carcinostatic effect of sarcolysin is unrealted to the energy metabolism of tumor cells as no noticeable change was produced in oxygen consumption or glycolysis.

Considering their experimental results as well as those reproted by other scientists, the authors conclude that sarcolysin acts chiefly on cell mitosis, rendering cells incapable of division and disrupting the protein balance of cells by preventing the synthesis of normal DNA.

P'eng Su-fen and Wang Ch'iu-ta (3769/3808/6671) reportedly participated in the technical work.

The paper was received for publication 25 January 1961. (FOR OFFICIAL USE ONLY)

NEW BOOK ON LUNG CANCER RESEARCH -- Peiping, Jen-min Jih-pao, 25 Sep 62, p 5

Fei-yen (Lung Cancer), a book recently published by the Shanghai Science and Technology Press, was written by a group of 18 medical teachers of the Shanghai Municipal Chest Surgery Hospital. The principle authors are Hsu Ch'ang-wen (1776/2490.2429) and Wu Shan-fang (0702/0810/ 5364).

The first part of the book consists of a resume of national and foreign contributions in the field, to which the authors have integrated their own views on clinical practices. They presented a rather important and systematic introduction from the point of view of causes, pathology, symptoms, diagnosis, and therapeutic and preventive aspects. In certain fields, they stated their own ideas and views.

The second part of the book discusses causes of illness. On the basis of 50 typical cases, the authors analyzed and discussed causal factors, methods of diagnosis, and therapeutic measures. They analized and made inquiries into such questions as why establish early diagnosis and why avoid delays and wrong diagnosis.

The authors consider diagnosis and surgery the principle factors and placed the most emphasis on early diagnosis. They compared pre-survery clinical diagnosis with postsurgery pathological diagnosis, using available facts and correcting errors.

SYMPOSIUM BEING HELD IN TIENTSIN ON HOSPITAL MANAGEMENT -- Peiping, Kuang-ming Jih-pao, 7 Sep 62, p 2

A symposium on hospital management and inprovement of the quality of treatment has been held weekly in Tientsin since June 1962. The symposium is being sponsored by the China people's and Worker's Democratic Party and the Chiu-san Society.

Among those participating in the symposium are Fan Ch'uan (5400/2938), director of [Tientsin] Pediatric Hospital; Fang Hsien-chih (2455/0341/0037), director, Osteology Department, [Tientsin] People's Hospital; Yu Sung-t'ing (5713/7313/1656), director, Surgery Department, [Tientsin] Medical University Hospital; Yang K'o (2799/3784), director of [Tientsin] Central Maternity Hospital; Chin Hsien-chai (6855/7359/1341), head of Tumor Department, [Tientsin] People's Hospital; Shih Hsi-en (2457/6932/1869), head of Urology Department, Tientsin Central Hospital No 1; and Lin Sung (2651/1516), head of Maternity Department, [Tientsin Central Hospital No 1?]. None of the above persons are party members.

MEDICAL TEAM VISITS NATIONALITY AREAS IN YUNNAN -- Peiping, Kuang-ming Jih-pao, 20 Sep 62, p 2

A lecture team composed of a group of high level medical personnel from Yunnan Province has visited the Yi and Pai nationalities areas to help local medical workers improve the quality of their work and prevent endemic dieases. In mid-September after 24 days of lecture activity, the team returned to K'un-ming.

This team was initiated by the Yunnan Province Society of Medicine, Pharmacology, and Health, and was composed of 11 professors and assistant professors from K'un-ming Medical College, and doctors from the Yunnan Province People's Hospital and the Yunnan Province Disease Prevention Station. They delivered lectures on 30 odd subjects such as "Natural Focus of an Epidemic", "Characteristics of and Prevention of the Transmission of Hook-worm", and "Epidemiological Investigation and Analysis" to more than 400 medical personnel. The lecture team also visited hospitals and assisted the medical personnel in diagnosis of doubtful cases.

RESEARCH INSTITUTE STUDIES PREVENTION OF LIVESTOCK DISEASES -- Peiping Pei-ching Jih-pao, 12 Jun 62, p 2

The Institute of Animal Husbandry and Veterinary Medicine of the [Peiping] municipal Academy of Agricultural Sciences, for the past several years, has been carrying out experiments and research in the prevention of livestock diseases and has achieved some definite results in the parasitic diseases of major animals and viral pneumonia of hogs. With the cooperation of units concerned, the institute tested more than 20 types of Chinese and western medicines and found one that was 52-84 percent effective in curing the sick hogs. After these results were confirmed in production circumstances, the institute promoted the widespread use of the medicine. At the same time, on the basis of the experience of the masses, they have formulated a procedure for early diagnosis and quarantine of cases of viral pneumonia in hogs, as well as comprehensive preventive measures, including disinfection, protection of fodder, and administering combined medicines.

On one of its most important current problems, the prevention of parasitic diseases of major animals such as horses, donkeys, etc., the institute has summarized the experience of the masses and organized a special group of personnel to carry on experiments and

research. They found that either orally administered medicines or intravenous injections would effectively cure such parasitic diseases as Rhinoestrus and Gasterophilus infestations, and intestinal worms or tapeworms. In addition, the institute has combined the production of more than ten kinds of livestock vaccines, and is continually studying means of improving vaccine quality. At present, research is being directed toward the development of an effective vaccine for duck cholera. (FOR OFFICIAL USE ONLY)

SCIENTIFIC CONFERENCE ON BRUCELLOSIS -- Peiping, Chung-kuo Ch'u-mu Shou-i, No 5, 1962, pp 33-34

The Scientific Conference on Brucellosis, sponsored by the Animal Husbandry and Veterinary Society of China in conjuction with its Peiping municipal counterpart, convened in Peiping in mid-October 1961. Twenty-eight research reports and work summaries were received at the conference.

Discussions at the meeting were concerned with the scientific control of brucellosis and centered on the following three topics:

1. The status of [brucellosis attenuated] bacterial vaccine No 19 and several years of experience in its use.

2. Practical and theoretical significance of the agglutination reaction in the diagnosis of brucellosis in milch cows.

3. Summation of experience in the breeding of brucellosis-free milch cows.

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DOMESTIC BRUCELLA BACTERIOLYSINS TESTED -- Peiping, Chung-kuo Ch'u-mu Shou-i (Chinese Animal Husbandry and Veterinary Medicine), No 5, 1962, pp 26-27

[Following is a description of an article entitled, "Results of the Use of Deomestic Brucella Bacteriolysin for Diagnosis of Brucellosis in Sheep," by P'eng Lien-sheng (1756/5571/3932), Ts'ui Ssu-lieh (1508/1835/0441), State-Operated Ch'ar-pei Stock Farm.]

The article presents the results of field experiments in support of the conclusion that Brucella bacteriolysin manufactured in 1958 by the Central Institute for the Control of Veterinary Biologicals was specific for the diagnosis of brucellosis in sheep and goats and not agglutinogenic. The bacteriolysin was tested on a limited number of animals in July 1958.

CONFERENCE HELD BY CHINESE SOCIETY OF PALEONTOLOGY -- Peiping, Kuang-ming Jih-pao, 10 Sep 62, p 1

Recently, the Chinese Society of Paleontology held its Ninth Conference in Peiping. Over 200 representatives from all parts of the country participated. One hundred and thirty three papers were submitted to the conference, covering all fields of paleontology.

Prof Sun Yun-chu (1327/0061/6999) presented a theory relating Paleozoic positive areas to the rise and subsidence of the seas.

At the close of the conference, Yin Tsan-hsun (1438/6363/0534) was elected chairman of the board of directors of the society; Sun Yun-chu (1327/0061/6999), Yang Chung-chien (2799/6945/0256), Szu Hsing-chien (2448/5887/0256), and 17 other persons were elected to the board of directors of the society.

AGRICULTURAL SCIENCE ORGANIZATIONS DEVELOP NEW CROP STRAINS -- Canton, Chung-kuo Hsin-wen, 10 Sep 62, p 9

The Chinese Academy of Agricultural Sciences and 17 provincial and regional agriculture research departments have bred more than 480 good strains of 26 different crops which result in varying degrees of increased yield over the ordinary seed. Most of these new strains represent better types of wheat, corn, paddy, millet, kaoliang, cotton, peanuts, and oil vegetables. Their increased yields are relatively noticeable. For instance, a new strain of paddy developed by the Kirin Academy of Agricultural Sciences, when grown in the northern paddy area, results in increased yields of 13-27 percent over original strains.

NEW VARIETY OF CUCUMBER EXCELLENT PRODUCER -- Peiping, Kuang-ming Jih-pao, 13 Sep 62, p 2

A new strain of cucumber, "Ning-ch'ing," developed by the South China Agricultural College, is drought and disease resistant and adaptable to the hot and humid climate of South China. In the past, Canton peasants planted. "Ta-ch'ing" and "Er-ch'ing," but these were subject to bacterial wilt. Large areas planted with "Ning-ch'ing" this summer produced healthy plants and excellent yields.

The new variety of seed was developed, under the direction of seed culture specialist Li P'eng-fei (6221/7720/7378) of the South China Agricultural College, by a section of the college's Horticultural Department, the Genetics and Seed Selection Teaching and Research Section, working with the vegetables team of the Horticultural Department, Kwangtung Branch, Academy of Agricultural Sciences.

NEW VARIETIES OF GRAPES DEVELOPED -- Peiping, Kuang-ming Jih-pao, 13 Sep 62, p 2

The Peiping Botanical Garden has developed new varieties of grapes which are suitable for cultivation in the Peiping area. They can withstand temperatures as low as minus 25 degrees centigrade. Many vineyards in the area are impressed with the new varieties and have requested plants from the Botanical Garden and plan to expand its cultivation for production. Last year the National Grape Wine Producers Association approved the grape for taste and commented on it rather favorably.

The botanical garden has been working on the new varieties since 1954. By repeated crossings of the wild mountain grape of Ch'ang-pai-shan in northeast China, a heavy producer that can withstand minus 40-50 degrees centigrade, the wild Tung-shih grape of North China, and the northeast variety, Pei-te, with two top quality grapes, the Mei-kuei hsiang and the Ya-li-shan, the garden now has 39 hybrids with a total of some 2,000 plants.

TECHNICAL SCIENCES

SYMPOSIUM ON GENERAL MECHANICS HELD IN PEIPING -- Peiping, Kuang-ming Jih-pao, 12 Sep 62, p 1

The Chinese Society of Mechanics held a symposium on general mechanics recently in Peiping. More than 80 researchers from concerned agencies, schools, and departments throughout the nation attended. They read and discussed 71 papers submitted by the delegates. In addition, they heard five summary reports written by the organizers of the symposium on "The Theory of Mechanical Stability," "Analytical Mechanics," "Controlled System Dynamics," "Gyroscope Technology," and "Gyroscopic Dynamics."

The conference divided into four groups, which discussed principles and application of analytical mechanics and general mechanics; the theory of mechanical stability, the theory of regulation, and nonlinear oscillation; flight mechanics; and gyroscopic theory. These four groups heard papers on machine and mechanism dynamics, analytical mechanics, mechanical stability and optimum control, aircraft stability and analysis of transients, research in drifting and gyroscopic stability, etc.

Ch'ien Hsueh-sen (6929/1331/2773), chairman of the board of directors of the Chinese Society of Mechanics, spoke to the conference, urging that research by workers in general mechanics follow the principle of joining theory and fact to the fullest extent. He expressed the opinion that general mechanics, like other branches of mechanics, must fully utilize the accomplishments of modern electronic computers and pay close attention to the mutual interchange between general mechanics and other branches of science.

The current conference underscores the progress which has been made in the field of general mechanics during the past few years. At the first national Mechanics Conference in 1957, the group on general mechanics presented only ten-odd papers.

RESEARCH IN HEAT ENGINEERING METROLOGY -- Peiping, Kuang-ming Jih-pao, 14 Sep 62, p 2

The first annual conference of the Chinese Society of Metrology Techniques and Instrument Making (Chung-kuo Chi-liang Chi-shu Yu I-ch'i Chih-tsao Hsueh-hui; (0022/0948/6060/6852/2111/5890/5280/0308/0892/9455/6644/1331/2585), on the topic of heat engineering, was held recently in Shanghai. The conference was attended by more than 100 specialists and technicians from research units, design departments, higher level schools, and plants throughout the country.

Chinese research in heat engineering metrology and the design and construction of heat engineering instruments has only developed since the liberation. Accurate measurement of temperature, flow, and pressure in modern chemical industry production processes, as well as many scientific experiments, depend on heat engineering instruments. This conference considered 42 papers on methods of making various measurements, and on instrument making. Prof Liu Pao (0491/5283) of the Precision Instrument Department, Tientsin University, presented a report on "a Gas Measurement Method for Heat Engineering Parameters," which attracted a good deal of attention. At present, most heat engineering parameters are measured by electrodynamic methods, so Professor Liu's method is a new technique. He also presented a detailed review of the advantages of using the gas method of measuring heat engineering parameters in modern automatic control systems. Assistant Prof Feng Shih-yen (7458/1597/7346) of the Chemistry Department, Northwest University, reported on "Use of Adiabatic Methods to Determine

the True Specific Heat of Liquids and Solids Under Normal Temperatures."
Engineers K'ang Ch'ing-yu (1660/1987/1342) and Sheng Wei-ch'uan (4141/1792/
2938), of the Heat Engineering Instrument Research Institute, First Ministry
of Machine Building, reported on "Research on a Gas-Activated Circulating
Test Measurement Installation." In this report, the authors explained that
the installation they constructed can replace 50 heat engineering instruments,
and requires only 4 seconds to measure the parameters at each point.

STUDENTS ENROLL IN TECHNICAL SCHOOLS -- Peiping, Kuang-ming Jih-pao,
19 Sep 62, p 2

Over 1,200 new students have recently enrolled in the spare-time schools
(classes) of the Shanghai Scientific and Technological Society. Among the
subjects they will study are radio, machinery, and foreign languages.

Since these schools were opened in 1960, over 1,000 two-year students
have been graduated and over 3,000 students are now enrolled. The students
are primarily junior technicans, young instructors, and cadres. Other subjects
taught include mechanics, veterinary medicine, weather, and over 20 others.

TEACHING METHODS COORDINATED AT SHANTUNG ENGINEERING COLLEGE -- Peiping,
Kuang-ming Jih-pao, 7 Sep 62, p 2

Last semester, the Class of 1962, Machine Technology Speciality Shantung
Engineering College, organized a teaching coordination group. Their prelimi-
nary investigations revealed that many students were deficient in foreign
language training, scientific research, knowledge of technical innovations,
and in other important subjects.

The team has rectified many of the weaknesses found by eliminating
redundancies and by making the quality of the instruction more uniform.

EARTH SCIENCES

TERRESTRIAL PHOTOGRAMMETRY USED IN DESERT SURVEYING -- Peiping, Ti-li
Chih-shih (Geographical Knowledge), Vol 11, No 6, Jun 60, pp 276-278

[The following are excerpts from an article, "Using
Terrestrial Photogrammetry ot Carry Out Position Observations
in Desert Areas," by Fan Hsin-ch'i (5400/1800/0967), no affili-
ation given.]

The use of terrestrial photogrammetry in desert areas has many ad-
vantages. It is useful in the study of steeply inclined areas, moving
objects, and microscopic objects; it is also modern and convenient.

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The advantages mentioned above make it suitable for position observations in desert areas. In desert areas, terrestrial photogrammetry can be used to study the shifting of sand dunes; the movement of sand grains; the phenomena of aeolian erosion and aeolian accumulation; the structure of sand dunes; and the sand ripples.

The Model 1318 automatic volume-measuring device base line range is 0-60 millimeters, the maximum error of two photographs is ± 12 millimeters. The lens may not be moved up or down more than 30 centimeters without causing difficultires.

The usual method used in terrestrial photogrammetry is to take photographs from the extreme ends of the base line using a photogrammetrical theodolite. This method can be simplified by using an ordinary camera at a fixed point, mounted on a tripod; the volume of the object can then be calculated by measuring the microscopic differences between the photographs. Laboratory experiments using the simplified method have proved satisfactory. (CONFIDENTIAL)

EXPEDITION SENT TO STUDY STRATIFICATION IN LUNG HSIEN, SHENSI -- Peiping, Kuang-ming Jih-pao, 7 Sep 62, p 1

Recently, the Shensi Provincial Society of Geology organized a joint expedition to study stratification in northwestern Lung Hsien, Shensi Province. The expedition was led by Tai T'ien-fu (2071/1131/1381), chief engineer, Shensi Geology Bureau, and by Yu Shih-yuan (6735/1102/0337), professor, Geology Department, Northwest University. Among the organizations represented in the expedition were the Shensi Geology Bureau; the Shensi Coal Fields Prospecting Bureau; the prospecting Office, Shensi Metallurgy Bureau; the Geology Department, Northwest University; the Geology Department, Sian Mining College; the Institute of Geology Shensi Branch [Chinese Academy of Sciences]; the Sian Geology School (Hsi-an Ti-chih Hsueh-hsiao; 6007/1344/0966/6347/1331/2699); the Ch'in-ling Geology Team; and the Joint Team No 4, Shensi Geology Bureau.

SURVEYING AGRICULTURAL LAND -- Peiping, Ti-li (Geography), No 1, Jan 61, pp 17-18

In surveying land that is to be leveled, a perpendicular drawer, a a level, and a gauge are needed.

The procedure is as follows: (1) Use the perpendicular drawer and the gauge to establish the horizontal. (2) Use the level, gauge, and a scale to measure the inclination. The slope of watered fields ought not to exceed 4 percent; the slope of dry fields ought not to exceed 10 percent. (3) The land is then leveled. (4) Finally, the land is resurveyed and the true area calculated

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In managing a commune's production, the cadres require a large-scale topographic map of the commune. The cadres also need to know how to use simple instruments and methods. A map of a production brigade ought to be on a scale between 1:2,000 and 1:5,000. It is best to use a transit theodolite to survey a commune as a whole, obtaining a series of triangulated fixes in the various production brigades and then combining them. The final map ought to be reduced in scale to 1:10,000--1:25,000. (CONFIDENTIAL)

IMPROVED AGRICULTURAL MAPS NEEDED -- Peiping, Ti-li No 1, Jan 61, pp 10-12

A great many maps are used in planning agricultural production. For example, in the winter of 1958, Heilungkiang Province compiled over 500 large-scale maps of people's commune population centers and over 1,000 large-scale maps of other population centers. Ho-ch'iu Hsien, in Anhwei Province, trained nearly 300 agricultural cartographers, of which over 100 are now competent to carry out hydrographic surveying work.

In spite of this, there are too few agricultural maps, on too small a scale, and not closely enough related to agricultural production. The subject matter in general topographic maps is insufficient; only five or six types of sandy and marshy land are indicated, cultivated land is only divided between watered fields and dry fields. On some maps, even though on a scale of one to several thousand, it is impossible to locate boundary lines for people's communes, administrative areas, or production brigades, not to mention field dikes, small hills, crops, or soil quality. Although these maps are fairly precise and sufficient for the needs of national defense and construction, they are inadequate for the needs of agricultural production.

In order to improve cartography, the technology involved must be improved, procedures must be simplified, capital outlay must be reduced, and efficiency must be raised. One method of doing this is to use aerial photographs. For example, experiments have shown that the compilation of a land utilization map for a production brigade of 40,000 mou, on a scale of 1:2,000, requires 45 work days when ordinary practices are employed; on the other hand, by using aerial photographs, only 20 work days are required to compile a land utilization map, a soil classification map, and a field rotation map for the same area. (CONFIDENTIAL)

HYDROGRAPHIC MAP PREPARED FROM MATERIALS GATHERED IN WELL-DIGGING --
Peiping, Ti-chih Hsueh-pao (Acta Geologica Sinica), Vol 41, No 1,
Jul 61, pp 6-13

[The following are excerpts from an article, "Preliminary
Experience in Compiling an Irrigation-WHydrographic Map of a
Piedmont Plain in Honan Province," by Chi Ch'uan-hao (4764/0278/
6275), no affiliation given]]

In order to better resolve the problem of using subsurface water for
irrigation, the primary need is to determine the distribution of the
water. In order to fulfill the responsibility, it is necessary to examine
the material collected by hsien and commune units in their well-digging
activities. In the absence of hydrographic survey work, and without basic
geologic, geomorphologic, or structural maps, there is no data from which
to compile hydrographic maps aside from the materials from mass well-digging
activities. Although delineation of areas according to their hydrographic
characteristic does not completely reflect the true hydrographic conditions
of each area, it can correctly guide water extraction more effectively than
delineation of area boundary lines according to geomorphologic or structural
characteristics.

Some persons do not fully appreciate the usefulness of the materials
mentioned above. They assert that the materials are fragmentary and local,
that the terminology is not standardized, that the entries are incomplete,
and that their use is troublesome, thus denying the scientific value of the
materials. Although it is true that the materials do not embrace all of
hydrographics, they are fairly complete for the purpose of deliniating the
soil horizons.

The materials from the mass well-digging activities must be put into
order and summarized. The terminology must be customary, so that the
masses can understand it easily. The features of the map must be in
common use and easily understandable, in order that the map may be used
by village hydraulic engineering cadres and well-digging teams.

During our work in a piedmont plain in Honan Province, we compiled
a glossary of soil horizon terminology in order to standardize it useage.
In this glossary, the over 40 kinds of soil found in this area were grouped
under eight scientific categories according to their sedimentary origin and
size.

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Once the data from the water wells has been collected, collated, and corrected, representative water wells are then indicated on a rough draft map and the necessary hydrographic explanations are added. The essential items to be included are: the soil horizon name, its thickness, its depth, the position of the water table, water quality, and quantity. In the past, analysis of water quality has relied solely upon chemical analysis. It is better to supplement this information with the experiences of the masses as to the water's taste, and its effect upon crops and the soil.

To analyze the thickness, lithographic character, and water quality and quantity of the water-bearing formation, we must select certain representative wells and connect up a number of horizontal and vertical hydrographic profiles.

In thepast, the principles of area delineation for hydrographic maps have emphasized delineation according to the effect of geologic, geomorphologic, and structural conditions upon hydrographic conditions. This is a suitable procedure for small-scale hydrographic maps but is inadequate in the compilation of large scale (1:25,000-1:100,000) hydrographic maps for use in field irrigation.

Irrigation--hydrographic maps ought to consist of, in general, two pages. The first ought to indicate the distribution of the subsurface water and the technical conditions for its exploitation. The second sheet ought to present a rational program for the development and utilization of the subsurface water. The correct principles, based on our experiences in a piedmont plain in Honan province, are discussed below.

It is important to keep in mind the significance of concealed sub-surface water in the delineation of primary areas. In the plain that we studied, we delineated four primary regions: areas of deeply buried ground water, semiartesian areas, artesian areas, and areas of shallowly buried ground water, semiartesian areas, artesian areas, and areas of shallowly buried ground water. The primary areas were subdivided into secondary areas according to the characteristics of the water-bearing formations, their depth, the presence of subsurface water, the output of the wells in the area, and water quality. An explanatory table ought to be included providing information on methods of excavation to be employed.

If the definite location of each well to be excavated cannot be shown on the planning map compiled for shien units, they can be indicated on the larger-scale map compiled for the commune.

The map for planning subsurface water exploitation must include not only methods to be used, but accurate calculations of the amount of water needed for irrigation of the area and the amount of subsurface water that can be exploited. This necessitates the calculation of the amounts of irrigation water required by various crops at various times. When time is short and quick results are needed, it only ought to take 10 to 15 days from the collection and putting in order of the materials to the entering of the data on the draft map. (CONFIDENTIAL)

CHINESE GEOGRAPHICAL SOCIETY HOLDS CONFERENCE -- Peiping, K'o-hsueh T'ung-pao, No 8, Aug 62, pp 43-44

The Geographical Society of China held a conference in Dairen from 5 June 1962 to 13 June 1962 to discuss the delineation of natural regions, and to announce the establishment of a Special Committee for Physical Geography.

Among the 70 papers presented at the conference, there were descriptions of the delineations of regions of various sizes and discussions of the theory of regional delineation.

It was agreed, during the discussion of regional delineation, that, despite the many principles of delineation that have been advanced, there has not been sufficient differentiation of these principles which has led to a certain amount of confusion. It was further agreed that the number of fixed principles of regional delineation ought not be too numerous, but there was some disagreement about the criteria to be used in the delineation of natural regions.

One point of view was expressed by Jen Mei-o (0117/5019/6948) and Yang Jen-chang (2799/4771/4545), both of Nanking University, in their explanation of their own delineation of the natural regions of China. They explained that their delineation was based on the peculiarities of China's geographical environment. They admitted that, although their delineation was done from the Chinese viewpoint, thus making it readily understandable, certain difficulties were encountered. For example, although the units they defined often closely corresponded with geological and geomorphological features, they did not often enough correspons with biological and climatic elements. In addition, without further consideration, the system would be unsuitable for application to the world in general.

Another important topic at the conference was the work done in delineating natural regions in intercommunicating provinces. Seven papers were presented dealing with the delineation of natural regions in the South China area, the Yunnan area, the western Szechwan-northern

Yunnan area, the Kiangsu area, the Honan area, the Liaoning area, and the Kirin area, respectively. Data on the resources of the Asian tropical zone, covering south China (including the Yunnan area), was the most plentiful because of the extensive amount of survey work done in that area in the past few years.

It was generally recognized that regional delineation work must be carried out in close cooperation with productive units, especially agricultural units. It was also suggested that the work of drawing up landscape-type maps be strengthened.

KWANGTUNG CALLS GEOGRAPHY CONFERENCES -- Peiping, Ti-li, No 3, Mar 61, pp 143-144

The Kwangtung Science Committee and the Provincial Science Society sponsored six medium- and small-scale conferences from 16 March 1961 to 30 March 1961. At these conferences, a total of 21 papers were presented. These consisted of 9 papers from the Geology and Geography Department, Chung-shan University; 6 from the Geography Department, South China Normal of College; 5 papers from the Canton Institute of Geography (now known as the South China Institute of Geography), Chinese Academy of Sciences; and one paper from the provincial Hydraulic Engineering and Electric Power Department. Aside from one paper each on geology and geomorphology, the other 19 papers all were concerned with present agricultural production.

At the first conference, held on 16 March 1961 Ts'ao T'ing-fan (2580/1694/5672) reported on the Ch'ang-ch'un Conference of the Chinese Geography Society; T'ang Yung-luan (0781/3057/7019) described the responsibilities that physical geography has towards agriculture; Liang P'u (2733/3302) reported the responsibilities that economic geography has towards agriculture.

At the third conference, held on 23 March 1961, four reports were presented. One dealt with the special environmental problems of the southern tropical belt in Fukien Province. A second dealt with the problem of the limit of the Kwangsi Southeastern Tropical Belt. A third dealt with the problem of the geographical distribution of recently formed corals in the South China Sea.

The fourth dealt with the geology and minerals of Kwangtung Province.

Topics dealt with at other conference included climate, the effect of sand on rice production, and the definition of agricultural areas.

GEOGRAPHY LABORATORY ESTABLISHED -- Peiping, T1-li, No 3, Mar 61, p 143

The instructors and students of the Geography Department, Kirin Normal College have established a modernized geography laboratory. Since July 1960, over 74 chemical analyses have been carried out in the laboratory under the direction of personnel from the Inner Mongolia Hydraulic Engineering Department, the Peiping Marsh Survey Team, and other units. To overcome the initial shortage of technicians, the General Party Branch organized teams of students and instructors to visit provincial and municipal units and observe their equipment. In a little over a month, over 40 students and instructors were able to carry out analyses.

AREA DELINIATION OFFICE SET UP IN HONAN -- Peiping, T-li No 3, Mar 61, pp 94-95

In 1960, the Honan Branch, Chinese Academy of Sciences, set up a provincial Area Deliniation Office, made up of personnel from related research institutes, science departments of universities and technical schools, and research organizations of production units. These persons were divided into 11 groups, covering such special fields as geomorphology, climatology, hydrography, pedology, botany, zoology, entomology, quaternary geology, hydrographic geology, and mining. Also participating in the work were technicians from science committees and societies in the various special districts, hsien, municipalities, and production units. All told, over 3,000 persons from over 30 units participated in the work of the office. Huang Ping-wei (7806/4426/4850), Institute of Geography, Chinese Academy of Sciences, directed part of the work. (CONFIDENTIAL)

WU-T'AI-SHAN WEATHER STATION REPORTS DATA TO PEIPING -- Peiping, Kuang-ming Jih-pao, 27 Aug 62, p 2

Since it was established in 1955, the Wu-t'ai-shan weather station in Shansi has successfully completed all the duties assigned to it, year after year. Each day, the station makes 16 weather observations and reports the results to Peiping.

This station is staffed by 11 young technicians from all parts of China. It is located in the Wu-t'ai-shan mountain range, at an altitude of 2,895.8 meters above sea level. This area has an average annual temperature of -4.3 degrees, with the thaw in May and first snows in August. There are strong winds on 195 days of the year.

CHINESE HYDROGEOLOGISTS PROSPECT FOR UNDERGROUND WATER RESOURCES --
Tallin, Sovetskaya Estoniya, 26 Aug 62, p 3

Several thousand Chinese hydrogeologists are conducting research
and prospecting of underground water resources as future supplementary
sources for irrigation of fields in the country's arid regions. The
prospecting area extends from the subtropic Luichow Peninsula in South
China to the lowlands in the basins of the Sungari and Liao-ho in
the northeast, as well as the vast steppes of Inner Mongolia.

By the end of the first half of 1962, the specialist hydrogeologists
succeeded in determining the exact location of underground water beds
over an area of 100,000 square kilometers. They also compiled a hydro-
geologic map of the vast area in North China, embracing more than 200
districts where underground waters may be used for irrigation.

Detachments of hydrogeologists have drilled over 3,800 wells in
various parts of the country during the course of their prospecting.
Purpose was to ascertain the conditions of these resources. These wells
were then given over to the people's communes for their use. The wells
drilled in the Peiping area will aid in irrigating over 800 hectares
of fields sown to vegetable crops.

TABLE OF CONTENTS OF GEOGRAPHY PERIODICAL -- Peiping, Ti-li, No 2,
Feb 62

"The Problem of the Limits of the Chinese Subtropical Zone,"
by Ch'iu Pao-chien (8003/1405/0495) [no affiliation given] (pp 41-45)

"The Development of Sinkiang's Geomorphological Conditions for
Agriculture and Animal Husbandry," by Chou T'ing-ju (0719/1694/0320)
and Chao Chi (6392/3444) [no affiliations given] (pp 46-51, 69)

"Improvement of the Sand Dune Areas Along the Kwangtung Coast"
(pp 52-54) [A summary of this article appears in FDD Summary No 3916]

"Soviet Scholars Study Element Migrating Power Under Surface
Conditions," by Wang Hua-tung (3769/5478/2639) [no affiliation given]
(pp 55-59)

"The Effect of Economic Geography Upon the Development of Regional
Geography Upon the Development of Regional Geography," by Hu Hsu-wei
(5170/1645/1218) [no affiliation given] (pp 60-63)

"Several Problems in Transportation Geography," by Chang Kuo-wu (1728/0948/0124) [no affiliation given] (pp 63-65)

"On Teaching Regional Economic Geography," by Su Su (5685/ 5685) [no affiliation given, but see below] (pp 66-69) [According to a note, this article has been discussed by the Economic Geography Teaching and Research Section, Geography Department, Nanking University.]

"Western Samoa," by Su Yung-hui (5685/3057/8748) [no affiliation given] (pp 70-72)

"Volume Calculation of Map Features," by Ch'en Chia-chen (7115/1367/2182) [no affiliation given] (pp 75-77)

"N. M. Volkov's Method of Measuring the Length of Rivers on Small-Scale Maps," by Ch'en Yu-chi (7115/3945/1015) [no affiliation given] (pp 76-77)

"Understanding the Mathematics in 'Knowledge of the Earth,'" by Chu Liang-hao (2612/5328/3493), Wenchow Middle School No 7 (pp 78-80) (FOR OFFICIAL USE ONLY)

CHEMISTRY AND CHEMICAL TECHNOLOGY

NEW SCALE PROPOSED TO ESTIMATE ELECTRONEGATIVITY -- Peiping, Hua-hsueh Hsueh-pao, Vol 27, No 3, Dec 61, pp 190-195

[The following is a Chinese-language abstract, supplemented with additional information from the text, of an article, "The Electronegativity of Atoms," by Kao Hsiao-hui (7559/1321/1863), Chemical Laboratory, Ch'ang-ch'un Geology College.]

This paper suggests a new scale to estimate the electronegativity of atoms by the mean effective potential of the valence electrons:

$$x = \frac{k}{N} \sum_{i=1}^{N} \left(\frac{z_i^* e}{n_i^*} \right)^2 \tag{1}$$

The relation of the new scale of electronegativity to that of Paulings is linear and is given by:

$$x(\text{Pauling}) = \frac{a}{N} \sum_{i=1}^{N} \left(\frac{z_i^* e}{n_i^*} \right)^2 + b \tag{2}$$

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where $a \approx 0.67$, $b = 0.65$; z_1^* is the effective nuclear charge action on the ith electron, and n_1 is the principal quantum number of the ith electron, to be calculated by Slater's method as modified by Hsu Kuang-hsien (1776/0342/2009) and Chao Hsueh-chuang (6392/1331/1641) (Hua-hsueh Hsueh-pao, Vol 22, 1956, page 441).

The electronegativities of more than 100 different valence states, were calculated using formula (2) above; the results obtained coincided very well with present data. The data also are closer to the "best values" decided upon by Pritchard and Skinner than those of any other authors.

Formula (2) can be used for atoms with differing valence electronegativities; The values of the electronegativity of hydrogen and palladium were the only unreliable values; we have not yet been able to explain this.

The electronegativities here calculated can be used without the help of experimental data. (CONFIDENTIAL)

ANALGESIC ANALOGS OF TETRAHYDROPALMATIN SYNTHESIZED -- Peiping, Hua-huseh
Hsueh-pao, Vol 27, No 3, Dec 61, pp 196-208

I Chin Kuo-chang (6855/0948/4545), Hsu Pin (5171/1755), and
others found that tetrahydropalmatin, a constituent of the Chinese plant
Corydalis ambigus, was a potent analgesic, but that it was difficult to
produce pharmaceutically and had unknown secondary effects. Therefore,
some analogous compounds of this alkaloid were prepared and tested for
analgesic activity.

Anhydrous aluminum chloride, hydrobromic acid, and hydroiodic aicd
were employed to hydrolyze and other linkages of the alkaloid, and 2,3,9,10,-
tetrahydroxy-5,6,13,13a-tetrahydro-8-dibenzo[a,g]quinolizine was obtained.
Acylation of the latter compound with propionyl chloride, butyryl chloride,
benzoyl chloride, p-nitrobenzoyl chloride, cinnamoyl chloride, and 3,4,5-
trimethoxybenzoyl chloride in the presence of pyridine gave the correspond-
ing esters. 2,3,9,10,-tetrahydroxy-5,6,13,13a-tetrahydro-8-dibenzo-[a,g]
quinolizine was converted into the tetrabutoxy compound upon interaction
with diazobutane.

When berberine was treated with anhydrous aluminum chloride, the methy-
lenedioxy group was split, but the methoxy linkages were not attacked. The
resultant compound, upon interaction with diethyl sulphate, formed 2,3-
diethoxy-9,10-dimethoxy-8-dibenzo-[a,g]quinolizine bisulfate. Catalytic
reduction of the latter compound with platinum oxide as a catalyst gave
a dihydro-derivative, while reduction with zinc and sulphuric acid gave
a tetrahydro-derivative.

II. N,N-Dimethyl-β-(3,4-dimethoxy)-phenethylamine was prepared by the
treatment of β-(3,4-dimethoxy)-phehethylamine with formaldehyde and formic
acid in a sealed tube at 125 degrees centigrade. The corresponding N,N-diethyl
compound was formed by condensation of β-(3,4-dimethoxy)-phenethyl bromide
with diethylamine. Similar condensation with piperidine gave the piperidino
compound.

In the presence of anhydrous sodium carbonate, N-methyl-β-(3,4-dimethoxy)-
phenethylamine condensed with benzyl chloride, β-phenethyl bromide or β-(3,4
-dimethoxy)-phenethyl bromide in ethanolic media, forming the corresponding
N-methyl-N-aryl-β-(3,4-dimethoxy)-phenethyl amines.

Acylation of -(3,4-dimethoxy)-phenethylamine with acetic anhydride or phenylacetyl chloride, followed by cyclization of the amides by means of phosphorus pentoxide and reduction of the products with zinc dust in hydrochloric acid gave 1-methyl-6,7-dimethloxy-1,2,3,4-tetrahydroisoquinoline and 1-benzyl-6,7-diemthloxy-1,2,3,4-tetrahydroisoquinoline, respectively.

Pharmacological tests of the compounds prepared are already in progress. (CONFIDENTIAL)

XYLENOL ORANGE USED IN ZIRCONIUM DETERMINATION -- Peiping, Hua-hsueh Hsueh-pao, Vol 27, No 3, Dec 61, pp 181-184

[The following is an English-language abstract appearing at the end of an article, "Calometric Determination of Zirconium Using Xylenol Orange," by Ch'en Yun-fang (7115/0061/5302) and Chu Chang-ch'i (2612/4545/4388), both of the Central Laboratory, Shanghai Bureau of Metallurgical Industry.]

The metal indicator Xylenol Orange may be used as a colorimetric reagent for the determination of zirconium.

The following procedure is proposed: Add 5-10 milliliters (ml) of hydrochloric acid containing 25-150 micrograms of zirconium to a 100 ml volumetric flask, and add one drop of 0.1 percent bromocresol green. Add 1:1 NH4OH until the color ... the solution just turns blue. Then add 1:1 HCl to discharge the blue color. Add 25 ml of 1:2 hydrochloric acid, heat to boiling, and keep this temperature for 10-15 seconds. Cool to room temperature, dilute to the mark with water, and measure the optical density of the solution at 560 millimicrons with a 2-centimeter cell, using the same amount of Xylenol Orange and hydrochloric acid as a blank.

This method is both sensitive and selective. With this method, 0.2 part per million can be determined. The presence of large amounts of aluminum (III), copper (II), iron (II III), tin (II, IV), titanium (III, IV), and zinc (II) does not interfere. (CONFIDENTIAL)

SWELLING OF POLYMETHYLMETHACRYLATE IN MIXED SOLVENTS STUDIED -- Peiping, Hua-hsueh Hsueh-pao, Vol 28, No 3, Dec 61, pp 214-218

[The following is a translation of a Chinese abstract of an article, "Polymethylmethacrylate in Mixed Solvents IV. Equilibrium Swelling of a Slightly Crosslinked Polymer in Mixed Solvents," by Ch'eng Jung-shih (4453/6954/2514) and Ch'in Wen (4440/3080), both of the Institute of Applied Chemistry, Chinese Academy of Sciences, and by Ch'ien Jen-yuan (6929/0086/2337), Institute of Chemistry, Chinese Academy of Sciences.]

The equilibrium swelling ratios of a slightly crosslinked polymethyl-methacrylate sample in toluene -- ethanol and acetone -- water mixed solvents were determined volumetrically. The values of swelling ratio Q, go through maxima at the volume fraction of the nonsolvent, $\sqrt{}=0.17$ (ethanol) and 0.02 (water) for the two systems, respectively, in parallel with the viscometric behavior observed in dilute solutions. It was found that the swelling ratios in θ solvent, Q_θ, is independent of the solvent -- nonsolvent ratios. The swelling behavior in solvents can then be expressed in terms of χ swelling $=(Q/Q_\theta)^{1/3}$. The solubility parameter of polymethylmethacrylate was estimated, from the results of the experiments, as 10.0. (CONFIDENTIAL)

STRUCTURAL FORMULA FOR IMPERIALIN PROPOSED -- Peiping, Hua-hsueh Hsueh-pao, Vol 27, No 2, Nov 61, pp 97-105

[The following is a Chinese-language abstract, supplemented with material from the text, appearing in an article, "Studies of Fritillaria Alkaloids XIII. The Chemistry of Imperialin: Location of the Secondary Hydroxyl and the Carbonyl Groups and the Stereochemistry of Rings A and B," by Liu Chu-chin (0491/6999/2516), Lu Jen-jung (7120/0088/2837), and Ho Feng-chen (0149/7685/3791), all of the Institute of Organic Chemistry, Chinese Academy of Sceinces, and by Chu Tzu-ch'ing (2612/1311/3237) and Huang Wen-k'uei (7806/2429/7608), both of the Department of Chemistry, Lanchow University.]

A survey of the rotation data and an examination of the characteristics of the ultraviolet absorption spectrum of desoxodihydroimperialon, coupled with biogenic considerations, appear to favor the location of the secondary hydroxyl group in imperialin at C-3.

The carbonyl group of imperialin is tentatively assigned to C-6 in order to account for the unusual chemical and spectral properties of anhydro-imperialin, which seems to behave like a cyclopropy ketone. In the mean-time, an extensive study of existing rotation data indicates that position 6 is as acceptable as position 7 as the site of the carbonyl.

The location of the tertiary hydroxyl group and the stereochemistry of rings A and B are discussed.

The structure of imperialin is provisionally presented as
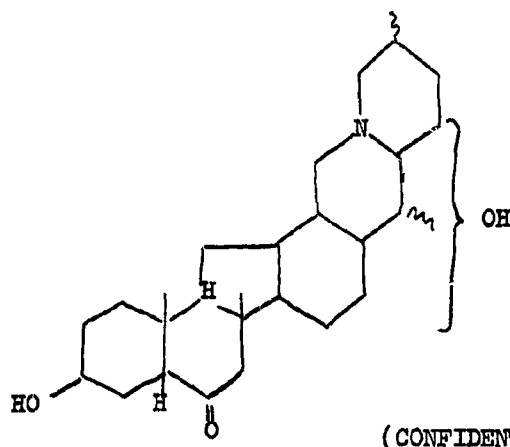

(CONFIDENTIAL)

TABLE OF CONTENTS OF CHEMICAL JOURNAL -- Peiping, Hua-hsueh Hsueh-pao, Vol 28, No 2, Apr 62

[The following articles were all received for publication between April 1960 and December 1961.]

"An Improved Rapid Method for the Determination of Carbon and Hydrogen in Organic Compounds," by Chang Yu-chih (1728/4245/0037), Huang Hui-chu (7806/1979/3796), and Chang Jen-pin (1728/0088/2430), all of the Institute of Materia Medica, Chinese Academy of Sciences (pp 75-79)

"Isomerization and Space Interference in Aromatic Hydrocarbon Alkylation Reactions," by Yang Tsan-hsi (2799/6363/3588), Institute of Chemistry, Chinese Academy of Sciences (pp 80-88) [According to the article, Yang performed the work reported on in this paper in the Chemistry Department, Leningrad University, USSR, under the direction of B. V. Ioffe.]

"The Chemical Constitutents of Huang-t'eng, Fibrauria Tinctoria Lour.," by Chu Jen-hung (2612/0117/1347) and Fang Sheng-ting (2455/5110/7844), both of the Institute of Materia Medica, Chinese Academy of Sciences, and by Ch'en Jui-ch'un (7115/6904/5023), First Shanghai Medical College (pp 89-95) [In the text, the following are credited with help in the microanalysis: Huang Hui-chu (7806/1979/3796), Chang Yu-chih (1728/4245/0037), Wu Ching-hsiang (0702/0079/7449), T'ao Kuei-ying (7118/2710/5391), Chiang Yu-t'ung (5592/3768/2717), Han Ling-ling (7281/3781/3781), and Jen Mei-li (0117/5019/5461); T'ang Jen-ch'uang (0781/0086/1886) and Fan Ming-chuan (5400/2494/1227) helped with the isolation; all of the above are affiliated with the Institute of Materia Medica, Chinese Academy of Sciences.]

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"A Preliminary Study of Ya-tan-tzu-tai," by Liang Hsiao-t'ien (2733/2556/1131), Huang Liang (7806/6852), Shao Kuo-hsien (6730/0948/6343), and Wu Yuan-liu (0702/0337/9393), all of the Institute of Pharmaceuticals, Chinese Academy of Medical Sciences (pp 96-99) [According to the text, the authors were assisted by Fu Feng-yung (0265/0023/3057), Institute of Pharmaceuticals, Chinese Academy of Medical Sciences, and by Chu Jen-hung (2612/0117/1347) and Huang Ch'eng-yuan (7806/4453/0997), both of the Chinese Academy of Sciences.]

"The Separation and Determination of Scandium and Thorium II. Quinaldinic Acid As a Reagent," by Liang Shu-ch'uan (2733/2885/2938) and Hung Shui-chieh (3163.3055/4105), both of the Institute of Chemistry, Chinese Academy of Sciences (pp 100-197) [According to a footnote, Li I-yu (2621/0044/7183) also participated in part of the work.]

"The Synthesis of Several Ethyl Nitro-Methyl-(or Alkoxy) Indole-2-Carboxylates and Their Corresponding Amino Compounds," by Weng Tsun-yao (5040/1415/1031), Institute of Materia Medica, Chinese Academy of Sciences; Wang Ch'ung-yen (3769/1504/6056), Shanghai First Medical College; and Wang Ting (3669/7844), Tientsin Research Institute of Pharmaceuticals (T'ien-ching Shih Yao-wu Yen-chiu So; 1131/3160/1579/5673/3670/4282/4496/2076), Ministry of Public Health (pp 108-113) [According to the text, the research was carried out under the direction of Prof Kao I-sheng (7559/1837/3932); Shu Han-li (5289/3352/7787) participated in the technical work.]

"Some Derivatives of p-Substituted Thip Benzoyl-Thio-Glycolic Acids," by Ko Huai-ch'eng (5514/2037/6134), Chiang Shang-hsin (5592/1424/0207), Ting Wei-kung (0002/4850/0501), and Wang Hui-ning (3769/1920/1380), all of Shanghai Second Medical College (pp 114-117)

"The Evaluation of Diffusion Coefficients of Complex Ions From Polarographic Data," by Chang Chien-min (4545/0256/3046), Shih Ch'ing-ho (2457/1987/0735), Chang Chi-hsien (1728/4949/0341), and Hu Hiu-jung (5170/1920/1369), all of the Inner Mongolia Medical College, and by Pai Ming-chang (4101/2494/1777), Inner Mongolia Agricultural College (pp 118-121) (FOR OFFICIAL USE ONLY)

MATHEMATICAL AND PHYSICAL SCIENCES

STUDY ON μ-CAPTURE PROBABILITIES -- Peiping, Scientia Sinica, Vol II,

No 8, Aug 62, pp 1067-1074

[The following is a full translation of the article,

"Probability of μ-Capture by Li^6," written in Russian by

CH'ING Ch'eng-jui (1987/2110/3843) of Peiping University. The

article was received for publication on 4 May 1962.]

RESUME

This paper computes the transition probabilities of $\mu^- + Li^6 \rightarrow He^6 + \varkappa$

in different hyperfine states of Li^6 meson atoms. Accurate to within 5

percent, it is demonstrated that the relation between the capture prob-

abilities from two different hyperfine states does not depend on nuclear

matrix elements.

INTRODUCTION

The process of μ-capture by nuclei has attracted great interest of

late. We can here prove the universality of the weak Fermi interaction,

as well as study phenomena connected with renormalization effects. Among

μ-capture phenomena, special place is accorded those processes during

which there is no emission of neutrons and other particles. Methods for

solving the beta-decay problem are theoretically applied to these proc-

esses. Moreover, matrix elements may be partially substituted by nuclear

matrix elements of the beta-decay. Transition probabilities of such

processes have been investigated theoretically in sources 1,2, and 3, for

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instance. But sources 1 and 2 do not discuss effects related to the hyperfine structure of μ-meson atoms. These effects, however, strongly influence transition probabilities, a fact first demonstrated theoretically in source 4.

Source 5 makes a detailed study of μ-capture by nuclei with spin 1/2. It was shown that, particularly in the case of the Gamov-Teller interaction, determination of the hyperfine structure leads to an interesting selection rule: probabilities of μ-capture from the singlet state F = 0 are connected only with renormalization effects. To prove this phenomenon, the μ-capture probabilities may be compared in the media of a conductor and an isolator. Among nuclei with spin 1/2, P^{31} is a suitable nucleus, since it has two different modifications. However, because the final nucleus Si^{31} has a complex structure of energy levels [source 6], some difficulty arises in the experimental separation of transition probabilities in the ground state of Si^{31}. Hence, in order to prove the aforementioned selection rule, we must investigate μ-capture by nuclei with spin greater than 1/2, for instance, Li^6 whose spin is 1.

Li^6 is more suitable from the experimental point of view. Just as with P^{31}, Li^6 may exist in the medium of a conductor as lithium metal and in the medium of an isolator, as ion crystal LiH. But the final nucleus of He^6 has only one excitation level, whose transition in the ground state is mainly through neutron emission [source 6]. Thus, by measuring the beta-electrons of He^6, it is possible to determine precisely the probabilities of μ-capture by Li^6 in various hyperfine states of the meson atoms.

Study of μ-capture by Li^6 also provides information on interaction constants. The following nuclei have been applied in literature to determine the interaction constant: proton, He^3 [source 7], Be^7 [source 8], Li^6, and C^{12} [source 1].

The capture of μ-mesons by protons is the best process for testing the theory. However, practical realization of the experiment by protons entails great difficulty because of complex effects connected with the formation of meson molecules [source 9]. As for the remaining nuclei, -capture by Be^7 and C^{12} leads to nuclei having somewhat excited levels which emit gamma-rays during transition to the ground state [source 6]. Much attention is usually directed on He^3, since the latter converts into a mirror nucleus during μ-meson capture. There are only three nucleons in these nuclei. By applying the charge-symmetry theory for nuclear forces, certain nuclear matrix elements may be accurately computed. In considering all the matrix elements of a higher order, Source 7 points out that these are all expressed by the same parameter. Although it is impossible to compute said parameter accurately, it may be empirically determined in the experiment for elastic scattering of electrons by He^3. It is possible to show that such approximated accuracy in the theoretical analysis of nuclear matrix elements is also obtained in the case of μ-capture by Li^6. Just as the matrix element may be accurately computed in the case of He^3, it is possible to obtain this in the case of Li^6 from experimental date on the ft-value in the $He^6 \rightarrow Li^6$ transition. As regards matrix elements of a higher order, in a particular selection of nuclear

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wave functions, they also reduce to empirically determined parameters.
On the other hand, empirical investigation of μ -meson capture by Li^6 is
many times easier than the investigation of μ -capture by He^3.

For the foregoing reasons, we consider the detailed study of μ -meason
capture by Li^6 as very important. This paper computes capture probabilities
in different hyperfine states. It is demonstrated that in neglecting cer-
tain matrix elements of a higher order, the relation between capture prob-
abilities from various hyperfine states does not depend on the nuclear
matrix elements. Values for the matrix elements are projected with the
aid of a shell model [Source 10]. It is concluded that the contribution
of higher-order matrix elements which were neglected in obtaining the
respective formulas amounts to only 2 percent. Finally, the accuracy of
the obtained results is discussed.

CAPTURE PROBABILITIES

The interaction Hamiltonian in μ-meson capture by nuclei has the following form:

$$H = \frac{G}{\sqrt{2}} \bar{\psi}_a (V_a + A_a + C_a + P_a)\psi_P \bar{\psi}_\nu \gamma_a (1 + \gamma_5)\psi_\mu$$

$$V_a = \gamma_a, \quad A_a = \lambda \gamma_a \gamma_5 \tag{1}$$

$$C_a = \frac{\mu'}{2m_P} \sigma_{a\beta}(P_\beta - n_\beta), \quad P_a = \frac{if}{m_\mu} \gamma_5 (P_a - n_a),$$

where all the symbols concur with Source 5.

If all the members to the first order are conserved from the velocity of the nucleons, and the nonrelativistic wave function is also applied for the μ-mesons, then the capture matrix element will be:

$$\frac{G}{2}\left\{ \langle v_\nu | 1 - \sigma v_0 | v_\mu \rangle \langle f | \sum_{i=1}^A \tau_i^{(-)} \left(G_\nu - G_P \sigma_i v_0 - \lambda \frac{\sigma_i P_i}{m_P} \right) e^{-in_i} \varphi_\mu(r_i) | i \rangle - \right.$$

$$\left. - \langle v_\nu | (1 - \sigma v_0)\sigma | v_\mu \rangle \langle f | \sum_{i=1}^A \tau_i^{(-)} \left(G_A \sigma_i - \frac{P_i}{m_P} \right) e^{-in_i} \varphi_\mu(r_i) | i \rangle \right\}, \tag{2}$$

where v_ν and v_μ are spin parts of the wave functions of the neutrino and the μ-mesons; $i\rangle$ and $\langle f$ are wave functions of the initial and final nuclei; $\varphi_\mu(r_i)$ is the Coulomb function of the μ-mesons in the Li[6] meson atoms.

The coefficients in (2) have the form:

$$G_P = 1 + \beta, \quad G_A = \lambda + \beta\mu,$$

$$G_P = \beta(f' + \mu), \tag{3}$$

where $\qquad \beta = \dfrac{v}{2m_P}, \quad \mu = \mu' + 1, \quad f' = f - \lambda.$

        To derive the expression for μ-capture probability, it is necessary to know the density matrix of the initial state of the μ-mesons. The general form for the density matrix for μ-mesons in the hyperfine state is indicated in Source 11. Let the nuclear spin $I = 1$. Then, after neutralization in the direction of the spin of the μ-mesons, we derive the term for the density matrix before capture by the Li^6 meson atoms:

$$\rho = (1 - a)\rho_{3/2} + a\rho_{1/2},$$

(4)

where

$$\rho_{3/2} = \frac{1}{6}\left(1 + \frac{1}{2}\,I\sigma\right), \quad \rho_{1/2} = \frac{1}{6}(1 - I\sigma);$$

$\rho_{3/2}$ and $\rho_{1/2}$ are density matrices in the states $F = \dfrac{3}{2}$ and $F = \dfrac{1}{2}$; $1 - a$ and a are the statistical weight of the two states, respectively. Using the method described in Source 12 for the computation, we obtain the formula for μ-capture probability for the transition $1^+ \rightarrow 0^+$:

$$\omega = \left(\frac{Z^3 G^2}{2\pi^2 a_\mu^3}\right) N_0 v^2 \left(1 - \frac{v}{A m_p}\right),$$

where

$$N_0 = \int \frac{d\Omega}{4\pi}\Bigg\{ G_A^2\langle\sigma_i\rangle^2 + \frac{\langle P_i\rangle^2}{m_p^2} + i2J_m G_A\langle\sigma_i\rangle^* \left\langle v_0 \times \frac{P_i}{m_p}\right\rangle -$$
$$- 2G_A G_P\langle v_0\sigma_i\rangle^*\langle v_0\sigma_i\rangle - 2\lambda G_A\langle v_0\sigma_i\rangle^* \left\langle \frac{\sigma_i P_i}{m_p}\right\rangle +$$
$$+ \left(G_P\langle v_0\sigma_i\rangle + \lambda \frac{\langle\sigma_i P_i\rangle}{m_p}\right)^2 - a'\Bigg[G_A^2\langle\sigma_i\rangle^2 + \frac{\langle P_i\rangle^2}{m_p^2} -$$
$$- 2G_A G_P\langle v_0\sigma_i\rangle^*\langle v_0\sigma_i\rangle - 2\lambda G_A\langle v_0\sigma_i\rangle^* \frac{\langle\sigma_i P_i\rangle}{m_p}\Bigg]\Bigg\},$$

(5)

where integration takes place in all directions of the neutrino flight, the coefficient $a' = 1 - 3a$, and

$$\langle \sigma_i \rangle = \langle f \left| \sum_{i=1}^{A} \tau_i^{(-)} j_0(\nu r_i) \sigma_i \right| i \rangle - \langle f \left| \sum_{i=1}^{A} \tau_i^{(-)} j_2(\nu r_i) \sqrt{4\pi \cdot 5} Y_{20}(\theta_i) \sigma_i \right| i \rangle;$$

$$\tag{6-i}$$

$$\frac{\langle P_i \rangle}{m_p} = \langle f \left| \sum_{i=1}^{A} \tau_i^{(-)} j_1(\nu r_i)(-i) \sqrt{4\pi \cdot 3} Y_{10}(\theta_i) \frac{P_i}{m_p} \right| i \rangle; \tag{6-ii}$$

$$\frac{\langle \sigma_i P_i \rangle}{m_p} = \langle f \left| \sum_{i=1}^{A} \tau_i^{(-)} j_1(\nu r_i)(-i) \sqrt{4\pi \cdot 3} Y_{10}(\theta_i) \frac{\sigma_i P_i}{m_p} \right| i \rangle, \tag{6-iii}$$

where θ_i is the angle between the vectors $\mathbf{v}_0$ and $\mathbf{r}_i$.

All higher-order matrix elements enter the obtained formula (5). But if we neglect the second member in (6 - i), (6 - ii), and (6 - iii), then (5) converts into the following:

$$N_0 = \left\{ (\lambda + \beta\mu)^2 - \frac{2}{3}\beta(f' + \mu)(\lambda + \beta\mu) + \frac{1}{3}\beta^2(f' + \mu)^2 \right\} \langle \sigma_i \rangle^2 -$$

$$- a' \left\{ (\lambda + \beta\mu)^2 - \frac{2}{3}\beta(f' + \mu)(\lambda + 3\mu) \right\} \langle \sigma_i \rangle^2. \tag{7}$$

In comparing (7) with the term for the transition probability for $\frac{1}{2}^+ \to \frac{3}{2}^+$ /Source 5/, it is then evident that the difference lies only in the fact that capture from the higher hyperfine state $F = \frac{3}{2}$ is forbidden during the transition $1^+ \to 0^+$. Hence, if we assume in (4) that $a = 0$, then the capture probability (7) is determined solely by one member having the coefficient β^2.

Consequent on this neglect, the matrix element in (7) takes the form:

$$\langle \sigma_i \rangle = \langle \sigma_{i\beta} \left(1 - \frac{1}{6}\nu^2 r^2 + \cdots \right) \rangle, \tag{8}$$

where the beta-decay matrix element corresponds to the first member. When nuclei are found in different media before capture, then only the value a' in (7) changes. Hence, in comparing the probabilities of μ-meson capture by Li^6 in various media, the nuclear matrix elements (8) completely cancel out.

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NUCLEAR MATRIX ELEMENTS

Three matrix elements were neglected in deriving formula (7). Let us appraise them separately. To obtain more accurate values, we shall use the wave functions of a shell model /Source 10/. Assume that the four nucleons in the shell 1S do not take part in this transition. Then the wave function of the ground state of Li^6 has the form:

$$\alpha\psi_i(^3S_1) + \sqrt{1-|\alpha|^2}\,\psi_i(^3D_1),\tag{9}$$

where

$$\psi_i(^3S_1) = \sum_m C^{00}_{|m|-m}Y_{1m}(r_1)Y_{1-m}(r_2)R_i(r_1)R_i(r_2)^3\chi_{M_i}{}^1\phi_0,$$

$$\psi_i(^3D_1) = \sum_{M,\,m} C^{1M_i}_{2M1M_i-M}C^{2M}_{1m1M-m}Y_{1m}(r_1)Y_{1M-m}(r_2)R_i(r_1)R_i(r_2)^3\chi_{M_i-M}{}^1\phi_0.$$

Indexes 1 and 2, respectively, denote two nucleons in the shell 1P; α and $\sqrt{1-|\alpha|^2}$ are the intensity amplitudes of the S- and D-waves in the ground state of Li^6. From the empirical value of the magnetic moment of Li^6, it is possible to know that $\alpha^2 = 0.88$. M_i is the magnetic quantum number of the initial nucleus. χ and ϕ are spin and isotopic spin functions of the nucleus. Letting R_i denote the radial wave function, we derive the solution for the harmonic oscillator potential:

$$R_i = (8/3\pi^{1/2}d^5)^{1/2}r\exp(-r^2/2d^2).\tag{10}$$

By analogy, for the final nucleus of He , the wave function takes the form:

$$\psi_f(^1S_0) = \sum_m C^{00}_{|m|-m}Y_{1m}(r_1)Y_{1-m}(r_2)R_f(r_1)R_f(r_2)^1\chi_0{}^3\phi_{-1}.\tag{11}$$

With the aid of functions (9), (10), and (11), it is possible to compute all the matrix elements in (5).

It is easy to see that the matrix element $\langle P_i\rangle_{m_p}$ equals zero. Inasmuch as it was assumed that the spin state of the two nucleons changes during the transition of $Li^6 \rightarrow He^6$, then all the matrix elements which do not

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conserve the spin operator of the nucleon vanish. This may be confirmed from experimental data on the lifetime of the 3.56 ^{M}eV level of Li^6, which is isotopically similar to the ground state of He^6. The matrix element obtained from the ft-value in He^6 accurately explains, within the experimental, the lifetime of the 3.56 ^{M}eV level of Li^6 ./Source 13/. This attests to the negligible minuteness of the matrix element $\left\langle \frac{P_i}{m_r} \right\rangle$.

/Note: ^{V}alue of the matrix element $\langle \sigma_i \rangle_e$ obtained from the ft-value in He^6 is 2.27. Substituting this value in the expression for the probability of the M 1 -γ-transition of $P_\gamma = \frac{e^2}{3} \frac{k^3}{m_p^2} \mu^2 \frac{|\langle \sigma_i \rangle_B|^2}{2}$, it is then obtained that the value of P_γ thus computed agrees, within the experimental, with the experimentally measured $P_\gamma = 0.139 \cdot 10^{17}$ sec^{-1} ./Source 14/. The computation made in Source 16 was obviously inaccurate./

In applying the property of function (10), it may be shown that the radial part of the matrix element $\left\langle \frac{\sigma_i P_i}{m_p} \right\rangle$ coincides with the radial part of the function. Thus, we obtain $\left\langle \frac{\sigma_i P_i}{m_p} \right\rangle / \langle \sigma_i \rangle_e = 0.029$. As regards the second member in (6-1), it is easily seen that the radial part takes the form $\langle r^2 \rangle$. If we select the value adopted in Source 1 for $\langle r^2 \rangle$, we then have $\langle \sigma_i Y_m \rangle / \langle \sigma_i \rangle_e = 0.01$.

By integrating in (5) in the directions of the neutrino flight, we obtain that the contribution from these matrix elements amounts to 2 percent.

Results obtained for the matrix elements depend on the selection of wave functions of the initial and final nuclei. Inasmuch as the accuracy of the shell model is questionable, we cannot, therefore, expect good accuracy in the obtained values. Just as it is possible to prove with the

aid of wave functions of the shell model that the contributions of these matrix elements are small, it is   possible to conclude that neglect of the matrix elements $\frac{\langle P_i \rangle}{m_p}$, $\frac{\langle \sigma_i P_i \rangle}{m_p}$ and $\langle \sigma_i Y_{2i} \rangle$ in (5) does not incur a large error. Calculations of matrix elements with the aid of a shell model were also made in the work of M. Gell-mann [Source 14]. In their opinion, inaccuracy of the shell model amounts to approximately 50 percent. If we increase this inaccuracy once again, then the error in (7) evoked by the matrix elements $\frac{\langle P_i \rangle}{m_p}$, $\frac{\langle \sigma_i P_i \rangle}{m_p}$, $\langle \sigma_i Y_{2i} \rangle$, amounts to 4 percent of the total probability of capture; that is, accurate to within 5 percent, the nuclear matrix elements (8) in (7) cancel out completely.

CONCLUSIONS

In comparing $\mu-$ meson capture probability by Li[6] in various media, it is possible to obtain, within the aforementioned accuracy, the following relationship between the interaction constants, which does not depend on nuclear matrix elements:

$$\lambda^2 + \frac{2}{3}\lambda\beta(2\mu - f') + \frac{1}{3}\beta^2\mu(\mu - 2f') = \frac{1}{9}\frac{R-1}{a_1 - a_2 R}\beta^2(f' + \mu)^2, \quad (12)$$

where R is the relationship of μ-capture probabilities by Li[6] in media 1 and 2. The coefficients α_1 and α_2, the statistical weight of the states of the meson atoms with $F = \frac{1}{2}$ in media 1 and 2, respectively, may be measured by the method in Source 15. The main matrix elements (8) are cancelled out deriving the relationship (12). Hence, within the 5 . percent experimental, (12) does not depend on the matrix elements. The shell model for this is applied only to obtain the values of the neglected members. To draw a conclusion on the interaction constants from the capture probability, it is necessary to know the precise values of the matrix elements. As indicated

above, within the 5 percent experimental, the value of the μ-meson capture probability depends only on the matrix elements (8). However, these could be empirically determined from the ft-value in He[6] and from the experiment on inelastic scattering of electrons (or μ-mesons) by Li[6] . The ft-value in He[6] is still not sufficiently accurate. As concerns the other matrix elements, they are given in the form $\langle \sigma_i \rangle_\beta$ and $\langle r^2 \rangle$. This conclusion depends, however, on the concrete selection of the nuclear wave functions.

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STUDY OF THE HAUSER-FESHBACH THEORY -- Peiping, Wu-li Hsueh-pao (Acta Physica Sinica), Vol 18, No 5, May 62, pp 227-241

[The following is a full translation of the Russian abstract appearing at the end of the Chinese article, "The Effect of Compound Nuclei on Nuclear Reactions at Low Energies," by WANG Te-yu (3769/1795/8747), CH'IU Hsi-chun (8003/6932/6874), CHAO Hsuan (6392/3763), LI Pai-wen (2621/4101/2429), and CH'EN Chin-Ch'uan (7115/6855/0356). The article was received for publication on 23 September 1961.]

Angular distribution of the inelastic scattering at low energy (neutrons with energies of 2-4 Mev, protons with energies of 3.5-7 Mev), excitation functions, and gamma-ray angular distribution are computed with the aid of a potential of an optical model with diffusion edge. The aim of this paper is to make a systematic quantitative proof of the Hauser-Feshbach theory.

Results of the computation show good agreement with the experiments. It was ascertained that the initial point of the Hauser-Feshbach theory on the effect of interference compensation between the various intermediate states is basically correct. Further, there is discussion on the possibility of applying the Hauser-Feshbach theory to determine certain parameters of the potential of the optical model and to ascertain the spins and the parity of the energy levels. Concerts examination was made in the case of N^{14} under strong excitation.

Results of the computation indicate that for N^{14}, spin values of the excited states with energies of 4.91 Mev and 5.01 Mev are equal to 0 and 2, respectively. Energy level spins are very sensitive to cross-sectional values but there is almost no effect on the parity. The Hauser-Feshbach theory is applied further to explaining the difference in the cross section of elastic scattering by protons between the neighboring odd nucleus and the even-even nucleus.

Finally, with regard to the approximate isotopic spin invariance in light nuclei, this paper concretely examines possibilities of isotopic spin conservation in the process of the reaction of intermediate nuclei. The Hauser-Feshbach formula for isotopic spin invariance is given. We computed angular distribution for both conserved and nonconserved isotopic spins for inelastic scattering of N^{14} in the first excited state with energy of 3.95 Mev (t = 0). It was found that results of the computation for nonconserved isotopic spins were closer to available empiritical data. Therefore, it may be stated that isotopic spins are poorly conserved for reactions on light nuclei within the framework of the theory of intermediate nuclei. (FOR OFFICIAL USE ONLY)

SURFACE RECOMBINATION MEASUREMENTS ON SILICON -- Peiping, Wu-li Hsueh-pao, Vol 18, No 5, May 62, pp 242-249

[The following is a full translation of the Russian-language abstract appearing at the end of the Chinese article, "Some Problems on Treating Silicon Surfaces," by SU Ch'ang-hou (1372/ 2490/0624). The article was received for publication on 25 October 1961.]

This paper examines the effect of etching on the value of the speed of surface recombinations on silicon and its stability with respect to time. There is a brief description of the major concept. Computed formulas are given for measuring s by the method of stationary photoconductivity. Experimental results are given for the measurement of s on silicon samples etched with different corrosives. Curves are given with their time dependence. Discussion ensures on favorable conditions for treating the surface for accurate measurement of the lifetime of the silicon sample. In addition, the effect of the specific resistance of silicon to the value of s is determined. According to our data, an aqueous solution of an alkali (10% KON) is the best etchant for silicon, giving low values for the speed of surface recombination. (FOR OFFICIAL USE ONLY)

STUDY OF ELECTROLUMINESCENCE -- Peiping, Wu-li Hsueh-pao, Vol 18, No 5, May 62, pp 250-253

[The following is a translation of the Russian abstract appearing at the end resume of the Chinese article, "Calorimetric Method for Measuring Absorption Capacity in Electroluminescence," by CHANG Kuang-chi (1728/1684/1015) and HSU Shao-hung (6079/1421/7703). The article was received for publication on 25 December 1961.]

This paper sets forth the measurement of absorption capacity in electroluminescence by the calorimetric method. This method is based on the law of energy balance. Consequently, the effect of harmonics and frequencies on the results of the experiment may be considered excluded.

From the obtained data, it is evident that the error in measurement does not exceed 5 percent for absorption capacity of less than 5mW. (FOR OFFICIAL USE ONLY)

PHOTOCONDUCTIVITY OF ANTIMONY SULFIDE -- Peiping, Wu-li Hsueh-pao
Vol 18, No 5, May 62, pp 254-258

[The following is a translation of the Russian abstract
appearing at the end of the Chinese article, "Photoconducti-
vity in Semicrystalline Layers of Antimony Sulfide," by HSU
Sheng (1776/5116) and LI P'ing (2621/1627). The article was
received for publication on 29 December 1961.]

The mechanism of photoconductivity in semicrystalline layers of $Sb_2 S_3$ is studied empirically. It was established that intercrystalline
transition layers play an important role in this. This paper reports
on certain experiments conducted and reviews the results obtained.
(FOR OFFICIAL USE ONLY)

STUDY ON ENERGY BARRIERS -- Peiping, Wu-li Hsueh-pao, Vol 18, No 5,
May 62, pp 259-263

[The following is a translation of the Russian abstract
appearing at the end of the Chinese article, "The Role of
Intercrystalline Energy Barriers in Photoconductivity of
Semicrystalline Layers of Lead Sulfide," by WU Ch'i (0702/
0796) and LI P'ing (2621/1627). The article was received
for publication on 29 December 1961.]

This is a study of heat treatment effect on electric conductivity
and photoconductivity of thin PbS layers. Noise intensity spectra and
the signal to noise ratio for thses layers were measured. From the
results of these experiments, it was concluded that the presence of
energy barriers near the transitional intercrystalline layers plays a
dominant role in the resistivity, photosensitivity, and noise of the
layers under consideration. (FOR OFFICIAL USE ONLY)

ELECTROMAGNETIC PROPERTIES OF LEPTONS DISCUSSED -- Peiping, Wu-li Hsueh-
pao, Vol 17, No 11, Nov 61, pp 512-519

[The following is a translation of a Chinese-language
abstract accompanying an article, "The Effects of Weak In-
teraction on the Electromagnetic Properties of Leptons,"
by Tai Yuan-pen (2071/0337/2609), Chinese Academy of Sciences.]

This paper discusses the effects of weak interaction on the electro-
magnetic properties of leptons. The theory of the vector field devel-
oped by Stueckelberg and Matthews is applied to the interactions between
leptons, the electromagnetic field, and the intermediate boson. The
matrix elements, accurate to the first order in e and G, are given.

The corrections to the anomalous magnetic moments of the charged leptons obtained in the present work are free from divergence and are independent of the mass of the intermediate boson. The ambiguity appearing in Ya. B. Zel'dovich's work which was published in (Journal of Theotrical and Experimental Physics), <u>Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki</u> Volume 39, 1960, page 1113), is not present. (CONFIDENTIAL)

HEAT CONDUCTION IN THE PRESENCE OF RADIATION -- Peiping, Wu-li Hsueh-pao, Vol 18, No 1, Jan 62, pp 26-34

[The following is a translation of a Chinese abstract accompanying a article, "The Problem of Heat Conduction in the Presence of Radiation," by Wang Chueh'i (3769/4554/3305), no affiliation given.]

This paper examines the problem of heat conduction inside a transparent body in the presence of radiation. A general equation of heat transfer was obtained. After careful study, the general equation of heat transfer in the stationary state was solved for four special forms of bodies: plane, circular cylinder, shpere, and prolate spheroid. In the plan problem, numerical calculations were carried out; the results differed from those obtained previously by Kellet. This paper points out that Kellet neglected the property of radiation that it is emitted in all direction; he considered only the radiation along the direction of temperature change, and so the equation of heat transfer obtained by Kellet differs [from our equation]. (CONFIDENTIAL)

PERTURBATION AND ANALYTICITY DISCUSSED -- Peiping, Wu-li Hsueh-pao, Vol 18, No 2, Feb 62, pp 91-117

[The following is a translation of a Chinese abstract, accompanying an article, "Perturbation Theory and Analyticity," by Chang Tsung-sui (1728/1350/3606), Chinese Academy of Sciences.]

This article is a simplified introduction to the recent use of perturbation theory in discussing theories of analyticity of scattering amplitude, including those of tarski and Eden. In the appendixes, a number of related problems are discussed.

In appendix one, it is explicitly shown that for neutron-pimeson and neutron-neutron scattering, the critical alpha for all points on the surface of singularities for the simplest diagram lies entirely outside the interval (0, 1) of the real axis, except those alpha corresponding to points on the spectral function boundary.

In appendix two, a heuristic proof of the chromatic dispersive re-
lations independent of the momentum transfer is provided. The proof
rests on averaging over the azimuthal angle of meson momentum (the
Breit system is employed, with the nuclear momentum oriented along
the polar axis).

In appendix three, a formulation that could lead to unitary con-
ditions is presented, facilitating the consideration of the unitary con-
ditions during the use of perturbation theory in studying analyticity.
(CONFIDENTIAL)

ATOMIC ENERGIES CALCULATED WITH SIMPLIFIED ANALYTIC WAVE FUNCTIONS
-- Peiping, Wu-li Hsueh-pao, Vol 18, No 2, Feb 62, pp 63-71

[The following is an abstract of an article, "Analytic
Wave Functions for Atoms," by Kou Ch'ing-ch'uan (5384/3237/
3123) and Huan Shu-hsun (7806/2885/0534), both of the Physics
Department, Kirin University.]

The energies of the first ten atoms in the periodic table were
calculated with a set of new variational wave functions. The form of
the wave functions that were used is as follows:

1s: $\Psi_1(r) = N_1 e^{-\mu a r}[1 + (\mu b r)^2]$,

2s: $\Psi_2(r) = N_2[(\mu r)e^{-\mu r} - N e^{-\mu c r}]$,

2p: $\Psi_3(r) = N_3(\mu d r) \cos\theta\, e^{-\mu d r}$,

$\Psi_4(r) = N_4(\mu d r) \sin\theta\, e^{i -\mu d r}$,

$\Psi_5(r) = N_5(\mu d r) \sin\theta\, e^{-i -\mu d r}$.

There are five variational parameters in all: a, b, c, d, and μ. The
parameter μ is a scale factor, the best value of which can be determined
analytically, leaving but four parameters to be determined numerically.
N_1, N_2, N_3, N_4, and N_5 are normalization factors. The constant N is
fixed so that Ψ_2 is orthogonal to Ψ_1.

The energies and the parameters of the various states were deter-
mined by the variational method. The use of our set of functions is sim-
pler and more convenient than the commonly used self-consistent field
method. The results of this calculation were better than those calculated
by Morse, Young, and Haurwitz with their four-parameter wave functions.
The results approximated those obtained experimentally and through the use
of the self-consistent field method. If we set c = 1 in our wave functions,
then there are only four parameters in all, and it will be found that the
results continue to be better than those found by Morse et al. (CONFIDEN-
TIAL)

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RESEARCH ON SUN-EARTH RELATIONSHIPS STUDIED -- Peiping, Kuang-ming Jih-pao, 19 Sep 62 p 2

The Chinese Society of Geophysics and the Institute of Geophysics, Chinese Academy of Sciences, convened a joint conference to study Sun-Earth relationships. The conference was held in late August in Peiping. Over 100 persons from related research organizations and higher schools were in attendance. The purpose of the conference was to discuss research related to the problems of the Sun-Earth relationships that had been carried out since the first conference on this subject was held in 1960.

Director Chao Chiu-chang (6392/0046/4545), Institute of Geophysics, Chinese Academy of Sciences, opened the conference with a simple intro-duction to international progress in research on sun-earth relation-ships. Chao emphasized the complexity of the physical phenomena and mechanisms of the sun-earth relationships.

Twenty papers, dealing with such subjects as theory of magnetic storms, analysis of solar physical-geophysical phenoma, and high atmos-phere and ionosphere physics, were presented at the conference. The discussion of variations in the outer radiation belt during magnetic storms was hampered by the incompleteness of observation data. Some problems of high atmosphere physics, such as shooting stars, atmos-pheric models, and ozone, were discussed. In addition, analyses of irreg-ularities of the ionosphere and experimental results pertaining thereto were reported.

Among the six comprehensive reports presented were "Progress and Trends in Solar Physics," by Deputy Director Ch'en Piao (7115/1753), Purple Mountain Observatory; and "A Comprehensive Report on Magnetic Storms," by Director Chao Chiu-chang of the Institute of Geophysics, Chinese Academy of Sciences.

YOUNG ASTRONOMY ENTHUSIASTS AT PEKING OBSERVATORY -- Canton, Chung-kuo Hsin-wen, 9 Sep 62, p 5

More than 100 middle-school students in Peiping are making visits to the Peking Observatory after school hours to participate in astronomt activities. There are special instructors at the observatory to assist the young astronomy enthusiasts. Some of these instructors are graduates from the Astronomy Department at Nanking University, while others astronomy enthusiasts of 10-20 years experience.

PHYSICS MONOGRAPH PUBLISHED IN SHANGHAI -- Canton, Chung-kuo Hsin-wen, 7 Sep 62, p 3

Well-known physicists Lu Hao-fu (4151/7729/4811), Chou T'ung-ch'ing (0719/0618/1987), and Hsu Kuo-pao (6079/0948/0202) have written a book entitled Shou-k'ung Jo-ho Fan-ying (Controlled Thermonuclear Reactions), which was recently published in Shanghai. In reviewing this new field of science, it presents a systematic introduction, in depth, of the theoretical foundations and experimental principles involved.

Controlled thermonuclear reactions are the most important prerequisite to the peaceful use of atomic energy. This 1.3 million-character book can be divided into two main parts, the first introducing the basic theory and the second giving detailed explanations of test installations for various applications. In the conclusion the authors suggest several subjects for further research and the imeediate prospects for thermonuclear work.

Controlled thermonuclear reaction is a key research project in many countries. There have been several hundred research papers on the controlled fusion of light nuclei published since 1958.

MISCELLANEOUS

MANY COLLEGES POSTPONE SCHOOL YEAR OPENING -- Peiping, Jen-min Jih-pao, 17 Aug 12 Sep 62

[Between 17 August and 12 September 1962, the Jen-min Jih-pao, announced the postponement of the opening of the new school year by the following colleges and universities. Dates in parentheses refer to the dates of publication.]

1. Announcement by Chekiang University -- As a result of unforseen circumstances, the vacation for the students in the current years graduating class at this school has been extended. It is hoped that these students will wait until receiving notification from the school before returning. 5 Sep 62, p 4)

2. Announcement by the Ch'eng-tu Telecommunications Engineering College -- The current year's graduating students of this college need not return to the school until 15 September. (29 Aug 62, p 4)

3. Emergency announcement by the Ho-fei Industrial University (Ho-fei Kung-yeh Ta-hsueh; 0678/5142/1562/1129/1331) -- It is hoped that the current year's graduating students of this school will return to the school before 15 September. (12 Sep 62, p 4)

4. Announcement by Nan-k'ai University -- The current year's graduating students of this school are scheduled to return to the school on 13 September. (17 Aug 62, p 4)

5. Announcement by Northeast Agricultural College -- has a result of unforeseen circumstances, the vacation period of the current year's graduating students at this college has been extended, and they are scheduled to return to the college before 15 September. (1 Sep 62, p 4)

6. Announcement by Peking Mining College -- As a result of unforeseen circumstances, the vacation period of the current year's graduating students at this college has been extended, and it is hoped that they will return to the school before 5 September. (22 Aug 62, p 4)

7. Announcement by the Shensi Industrial University (Shan-hsi Kung-yeh Ta-hsueh; 7104/6007/1562/2814/1129/1331) -- Students graduating from the 1962 summer session at this school should return to the school on 20 September; students taking supplementary examinations should return on 10 September. (2 Sep 62, p 6)

8. Announcement by the Sian Chiao-t'ung University, (Hsi-an Chiao-t'ung Ta-hsueh; 6007/1344/0074/6639/1129/1331) -- As a result of unforeseen circumstances, the vacation period of the current year's graduating students at this school before 22 September. (31 Aug 62, p 4)

9. Announcement by Tientsin University (T'ien-chin Ta-hsueh; 1131/3160/1129/1331) -- As a result of unforeseen circumstances, the vacation period of the current year's graduating students at this school has been extended, and it is hoped that they will return to the school before 10 September. (17 Aug 62, p 4)

10. Emergency Announcement by Tsinghua University -- The date for the return of the current year's graduating students of this school has been extended to 10 September. Please inform one another. (25 Aug 62, p 4)

[Although it does not mention a postponement, the following item may indicate some curtailment of service.]

Announcement by the Peking Aeronautics College -- This college will not accept refresher students who are not working within a study plan or auditing students who will require living accomodations. Please accept our regrets. (2 Sep 62, p 6)

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CHINESE DELEGATE SPEAKS AT WORLD SCIENTIFIC CONGRESS -- Peiping, Jen-min Jih-pao, 22 Sep 62, p 3

The Seventh Congress of the World Federation of Scientific Workers was held in Moscow from 13 to 15 September. One of the Chinese delegates, Chou P'ei-yuan (0719/1014/3293), was selected as a deputy chairman of the congress, and another Chinese delegate, Chang Wei (1728/4850), was selected as an honorary treasurer.

On the morning of 15 September, Chou P'ei-yuan delivered an address to the entire congress. [The address consisted of propaganda attacks on the US as a threat to peace for its failure to disarm and cease nuclear testing and as in imperialist power which impedes the development of the backward nations.] Before the issuance of the draft resolution of the congress, Chou presented a long statement setting forth the viewpoint of the Chinese delegation, maintaining that the resolution should point out that the enemy of peace is aggressive force and that the protection of peace depends mainly on the people's struggle and supporting popular independence movements, etc. However, these suggestions were not adopted, and the Chinese delegation did not participate in this resolution. The congress did pass a resolution concerning aid to newly developed nations, which the Chinese delegation endorsed fully.

CHINA, KOREA SIGN SCIENTIFIC COOPERATION AGREEMENT -- Peiping, Ta Kung Pao, 23 Sep 62, p 1

The fifth conference of the Chinese-Korean Scientific and Technological Cooperation Committee was held in Peiping on 7-22 September. The conference discussed items of scientific and technical cooperation between the two countries and problems of scientific and technical cooperation and concluded with the signing of a conference resolution.

The resolution specifies that China will support Korean scientific and technical personnel in their investigations of China's metallurgy, chemical industry, machinery, light industry, and tectile industry. China will also supply Korea with data on machinery, light industry, and textiles and with seeds for agricultural crops and medicinal herbs. Korea will similarly support Chinese scientific and technical personnel in their investigations of Korea's construction, aquatic products, etc, and will supply technical material on metallurgy, textiles, construction, etc., as well as good seed for agricultural crops.

Signing the resolution were, for China, Chang Chen (1728/3791), Vice Minister of Chemical Industry and chairman for the Chinese side of the Committee; and, for Korea, Chon Ho-son, Deputy Director of the Light Industries Commission and chairman for the Korean side of the committee.

CHINA, BULGARIA SIGN SCIENTIFIC COOPERATION AGREEMENT -- Peiping, Kuang-ming Jih-pao, 14 Sep 62, p 3

The sixth conference of the Scientific and Technological Cooperation Committee of the People's Republic of China and the Bulgarian People's Republic was held in Peiping from 27 August to 13 September. On the final day of the conference, representatives of both countries signed a resolution. The resolution specifies that concerned Chinese agencies will supply concerned Bulgarian agencies with scientific and technical data on chemical engineering, petroleum, construction engineering, etc. and good seed for agricultural crops and research material concerning it, as well as provided assistance to Bulgarian specialists investigating production experiences in light industry and agriculture. Concerned Bulgarian agencies will supply concerned Chinese agencies with scientific and technical data on chemical industries and food-stuffs and good seed for agricultural crops, as well as assist Chinese specialists investigating production experiences in the chemical industry.

Signing the agreement were, for China, Wei Chen-Wu (7614/7201/ 0063), Vice-Minister of Agriculture and Chairman of the Chinese side of the committee, and, for Bulgaria Stoyan Syulemezov, deputy chairman of the State Planning Commission and chairman for the Bulgarian side of the committee.

BIOGRAPHIC INFORMATION

/¯The following biographic information on selected
Chinese Communist scientific and technical personnel was
taken from sources cited in parentheses._/

AN Chih-min (1344/1807/2404), assistant researcher, Instutute of Archeol-
ogy, Chinese Academy of Sciences, recently made a report at the
China Historical Museum entitled "On the Type and Periods of Yang-
shao Culture." (Peiping, Kuang-ming Jih-pao, 25 Jul 62, p 1)

CHANG Lung-chih (1728/7893/1807), director of Animal Husbandry and Veteri-
nary Medicine Department, Shansi Agricultural College, and researcher
in pig breeding for more than 20 years, has made many literary con-
tributions in his field. (Peiping, Kuang-ming Jih-pao, 18 Jul 62,
p 1)

CHANG Tsung-ping (1728/1350/3521) /¯no affiliation given_/, author of
an article, entitled "Further Discussion of 'The Nucleic Acid Code
for Synthetic Protein,'" which expands upon and supplements an
earlier article on the same subject which appeared in the 5 July 1962
issue of the Jen-min Jih-pao. (Peiping, Kuang-ming Jih-pao, 18 Sep 62
p 2)

CHAO Chiu-chang (6392/oo46/4545) /¯no affiliation given_/, author of an
article entitled "The Development and Prospects of Astrophysics."
(Peiping, Kuang-ming Jih-pao, 28 Aug 62, p 2)

CH'ENG Shao-ching (4453/4801/4408), vice-president, /¯China_/ Academy of
Agricultural Sciences, spoke on the characteristics of brucellosis
bacterial vaccine No 19 at the October 1961 converence on brucellosis
held in Peiping. (Chung-kuo Ch'u-mu Shou-i, No 5, 1962, p 33)

CHENG Szu-chung (6774/2448/0022)
YANG Te-ch'ing (2799/1795/0615)
/¯Both affiliated with_/ Institute of Geography, Chinese Academy
of Sciences, coauthors of an article entitled "The Water-Vapor
Content of Chinese Continental Air." (Peiping, Ti-li Hsueh-pao
/¯Acta Geographica Sinica_/, Vol 28, No 2, Jun 62, pp 124-136)

CH'I T'ien-yu (4847/1131/0147), Soil Team, Design College, Hydraulic
Engineering Department, Hopeh Province, author of an article,
"Problems and Opinions Concerning Secondary Soil Salination
Prevention in Pa Hsien, Hopeh Province." (Peiping, T'u-jang
/¯Soil_/, No 3, Jun 62, pp 45-48.) (FOR OFFICIAL USE ONLY)

CHIA Ta-ling, author of dissertation (1961) for the scientific degree of Candidate of Technical Sciences, "Theoretical and Empirical Investigation of Washing of Saline Soils," in Russian. (Moscow, Izvestiyz Timiryazevskoy Akademii, No 2, Jun 62, p 240)

CHIA Tsui-kung (6328/6816/0361), Hunan Institute of Agricultural Sciences, author of an article, "Cultivation Techniques for Nitrogen-Fixing Blue Algae in Rice Paddies and Fertilizer Effectiveness." (Peiping, T'u-jang, No 3, Jun 62, pp 21-28) (FOR OFFICIAL USE ONLY)

CHIN Yung-t'any, Candidate of Technical Sciences, author of article, "New Design of Reinforced Concrete Lining for Canals," in Russian. (Moscow, Gidrotekhnika i Melioratsiya, No 9, Sep 62, pp 47-50)

CHOU Chia-hsing (0719/1367/52'1), lecturer, Biology Department, Hsin-hsiang /Municipal/ Teachers College, Honan Province, recently published an article entitled "On the Question of Zoological Boundry Lines in Honan Province." (Peiping, Kuang-ming Jih-pao, 7 Sep 62, p 1)

CHUNG Chao-lin (6945/0340/7792), vice-president of Kan-nan Normal College, Kiangsi Province, recently addressed historical circles on the nature of WANG Shou-jen's theories. (Peiping, Kuang-ming Jih-pao, 9 Jul 62, p 1)

CHUNG Kung-fu (6945/0501/3940), Geography Department, South China Normal College, author of an article, "Theories of the Kwantung Agricultural Area." (Peiping, Ti-li Hsueh-pao, Vol, No 2, Jun 62, pp 149-161)

HSI Ch'eng-fan (1598/2110/5672) /no affiliation given/, author of an article, "The Genesis and Differentiation of Agricultural Souls." (Peiping, T'u-jang, No 3, Jun 62, pp 1-5) (FOR OFFICIAL USE ONLY)

HSIUNG I (3574/3015)
LIU Wen-cheng (0491/2429/2398)
    /Both of/ Institute of Soils, Chinese Academy of Sciences, coauthors of an article, "The Crucial Significance of Water Drainage in the Prevention of Soil Salination in the North China Plains." (Peiping, T'u-jang, No 3, Jun 62, pp 6-11) (FOR OFFICIAL USE ONLY)

HSU Chi-ch'uan (6079/0370/3123), Institute of Soils, Chinese Academy of Sciences, author of an article, "Thoughts After Reading 'Clay Minerals in Chinese Rice Paddy Earth.'" (Peiping, T'u-jang, No 3, Jun 62, pp 29-30) (FOR OFFICIAL USE ONLY)

HSU Chun-ming (1776/0193/7686) /no affiliation given/ supervised the draft-
ing of the map included in the article "Some Preliminary Opinions on the
Delineation of the Comprehensive Natural Regions of China." (Peiping,
Ti-li Hsueh-pao, Vol 28, No 2, Jun 62, pp 162-167)

HSU Shu-ying (1776/3219/5391), Institute of Geophysics, Chinese Academy
of Sciences

KAO T'ien-hsi (7559/3944/4406), Institute of Geophysics and Glaciers, Snow
Accumulation, and Tundra (Ti-ch'iu Wu-li Ping /-ch'uan Chi-/ hsueh
Tung-t'u Yen-chiu So; 0966/3808/3670/3810/0393/1557/4480/7185/0408/
0960/4282/4496/2076), Chinese Academy of Sciences, coauthors of an
article, "Seasonal Wind Phenomena of the Tibetan Plateau." (Peiping,
Ti-li Hsueh-pao, Vol 28, No 2, Jun 62, pp 27-123)

HUANG Hsin-Hua (7806/2450/5478)
TSENG Shui-ch'uan (2582/3055/3023)
I Shao-chen (2496/4801/2823)
WANG Chin-san (3076/2516/0005)
/All affiliated with/ Geology and Geography Department, Chung-shan
University, coauthors of an article, "Salination Problems of the Hsi
kchiang Delta." (Peiping, Ti-li Hsueh-pao, Vol 28, No 2, Jun 62,
pp 137-148)

I Shao-chen (2496/4801/2823) /no affiliation given/ supervised the writ-
ing of the article "Some Preliminary Opinions on the Delineation of
the Comprehensive Natural Regions of China." (Peiping, Ti-li Hsueh-
pao, Vol 28, No 2, Jun 62, pp 162-167)

JENG Te-hou, Laboratory of Nuclear Reactions, Joint Institute of Nuclear
Research, Dubna, coauthor with V. Knobloch of ten-page book, "Electro-
phoresis of Complex Compounds. 1. Rapid Separation of Rare Earth
Elements by Electrophoresis on Paper, Using Ethyl enediaminotetraaceric
Acid," in Russian, in 1962. (Moscow, Knizhnaya Letopis', No 37, 1 Aug 62,
p 17)

K'ANG Hsing-wei (1660/5281/5898), professor, tobacco plant specialist,
Shansi Agricultural College, assembling material in preparation for
a book, Tobacco Seed Cultivation. (Peiping, Kuang-ming Jih-pao,
18 Jul 62, p 1)

KAO Liang (7559/2733) /no affiliation given/, author of an article, "The
Genesis, Development, and Utilization of the Soil in the Tropical
Rain Forests of Hsi-shuang Pan-na Thai Autonomous Chou." (Peiping,
T'u-jang, No 3, Jun 62, pp 50-52) (FOR OFFICIAL USE ONLY)

KUO T'an-yuan (6665/5917/3293), director of the Research Institute of Muni-
cipal Engineering, Academy of Architectural Sciences, /Ministry of
Building_/, author of an article entitled "The Disposition and Use
of Contaminated Water From Industry." (Peiping, Kuang-ming Jih-pao,
18 Jul 62, p 2)

LIN Chih-kuang (2651/0037/0342) /no affiliation given_/, author of an
article entitled "World Weather." (Peiping, Jen-min Jih-pao, 29 Aug 62,
p 4)

LIN Tieh-yu, Moscow Mining Institute, Aspirant, coauthor with V. N.
Kutuzov of article, "Action of Blasting Charge on Crumbling Rock,"
in Russian. (Moscow, Gornyy Zhurnal, No 9, Sep 62, pp 41-43)

LIU Yin-han (0491/5255/3352), Geography Department, Shensi Normal University,
author of an article, "Some Opinions About 'Problems of Delineating
the Natural Regions of China.'" (Peiping, Ti-li Hsueh-pao), Vol 28,
No 2, Jan 62, pp 169-174)

LIU Yin-wu (0491/5593/2976), professor and director, Domestic Cattle Station,
Scientific Experimental Farm and Livestock Station, Northwest Agri-
cultural College. (Peiping, Kuang-ming Jih-pao, 10 Sep 62, p 1)

LIU Yu-t'ang, Moscow, Institute of Hygiene and Prevention of Diseases,
Academy of Medical Sciences, USSR; author of article, "Effect of
Beryllium on Tissue Respiration," in Russian. (Moscow, Gigiyena
Truda i Professional' nyye Zabolevaniya, No 9, Sep 62, pp 41-44).

LIU Yuan-kan (0491/0337/1631), Electrical Engineering Teaching and Research
Section, Peiping Post and Telecommunications College; author of an
article, "A Few Thoughts on Teaching in Practice Classes." (Peiping,
Kuang-ming Jih-pao, 10 Sep 62, p 2)

LU Hsiao-wu (0712/2400/0710), assistant professor, Shansi Agricultural
College, sheep breeding researcher; currently engaged in revising
his scholarly writings in his field. (Peiping, Kuang-ming Jih-pao,
18 Jul 62, p 1)

LU Ping-chang (7120/3521/4545), Yen-ch'eng Special District Institute of
Soils, author of an article, "Results of Using Phosphorus Fertilizer
on Littoral Saline Soil." (Peiping, T'u-jang, No 3, Jun 62, pp 56-58)
(FOR OFFICIAL USE ONLY)

LUAN Chih-min (2940/3112/3046), vice-chairman, Liao-ch'eng Special District
Science Committee

YEN Ching-ming (7051/4842/2494), Deputy Chief, Agriculture Bureau, Liao-
ch'eng Special District

YEN P'eng-yu (3533/2590/0645), Deputy Director, Liao-ch'eng Special District Institute of Agricultural Sciences.

Coauthors of an article, "Preliminary Analysis of the Experiences of Comrade Liu Chang-huai's (o491/1728/2037) Labors To Improve Salination." (Peiping, T'u-jang, No 3, Jun 62, pp 41-44) (FOR OFFICIAL USE ONLY)

PAO Chien-ch'ing (7637/7003/3237), professor, 70 years old, Kirin Medical College, recently made two scholarly reports: one on a blood study of sick persons in provincial localities and one on refracted granules and particles under the electron microscope. (Peiping, Kuang-ming Jih-pao, 30 Jul 62, p 1)

T'ANG Chi-hsueh (o781/0370/7185), Institute of Material Medica, Chinese Academy of Medical Sciences, author of an article entitled "Drug Resistance of Germs." (Peiping, Pei-ching Jih-pao, 14 Jun 62, p 2) (FOR OFFICIAL USE ONLY)

TSENG Han-ming /‾no affiliation given_7, coauthor with G. S. Kolesnikov of article, "Graft Copolymers," in Russian. (Moscow, Uspekhi Khimii, Vol 9, Sep 62, pp 1025-1045)

TU Chu-ming (2629/4554/6900), professor, Shansi Agricultural College, currently engaged in revising his articles on the China's agricultural and scientific heritage. (Peiping, Kuang-ming Jih-pao, 18 Jul 62, p 1)

TU Kuo-kuang (2629/0948/3798), first-year teacher, Mathematics and Mechanics Department, Lan-chou University, has improved reading of foreign language reference material through training course. (Peiping, Kuang-ming Jih-pao, 11 Sep 62, p 2)

T'UNG Chen-i (olo4/2182/0001)
CH'EN Jen-ch'uan (7115/0088/3123)
     /‾Both of_7 Te-chou Special District Institute of Agricultural Sciences, Shantung Province, coauthors of an article, "Variation in Salination Patterns After Major Floods and Suggestions for /‾Salination_7 Control." (Peiping, T'u-jang, No 3, Jun 62, pp 52-53) (FOR OFFICIAL USE ONLY)

WANG An-ch'iu (3076/1344/3808), Institute of Geography, Chinese Academy of Sciences, author of an article, "The Physical Conditions and Soil Composition of the Brown Soil Belt in the Deserts and Prairies of the Eurasian Land Mass." (Peiping, Ti-li Hsueh-pao), Vol 28, No 2, Jun 62, pp 93-110)

WANG Chi-chih (3769/0679/2535), Comprehensive Prospecting Team, Department of Agriculture, Liaoning /_Province_/, author of an article, "The Genesis and Prevention of Secondary Soil Salination North of the Yin Ch'uan." (Peiping, T'u-jang, No 3, Jun 62, pp 48-49) (FOR OFFICIAL USE ONLY)

WANG Shou (3769/4898), president, professor, soybean specialist, Shansi Agricultural College, currently engaged in revising his prelivera-tion book, Using Animal and Plant Statistics. (Peiping, Kuang-ming Jih-pao, 18 Jul 62, p 1)

WANG Shou-chueh /_no affiliation given_/, coauthor with V. I. Stafeyev and L. V. Filina of article, "Triodes With N-Shape Characteristics Featured," in Russian. (Moscow, Radiotekhnika i Elektronika, Vol 7, No 8, Aut 62, pp 1404-1408).

WANT T'ung-seng, Laboratory of Nuclear Reactions, Joint Institute of Nuclear Research, Dubna, coauthor with I. Bradstetr and V. V. Volkov of ten-page book, "Obtaining Fine Layers of Uranium Dioxide on Aluminum Foil," in Russian, in 1962. (Moscow, Knizhnaya Letopis', No 37, 1 Aug 62, p 17)

WANG Yu-an, author of dissertation (1961) for the Scientific Degree of Candi-of Technical Sciences, "Sorting of Rice and Cotton Seeds According to Specific Weight in Liquid," in Russian. (Moscow, Izvestiya Timiryazev-skoy Akademii, No 2, Jun 62, p 229)

WEN Chen-wang (2429/2182/2489)
LI Chin (2621/6930)
CHEN Te-hua (7115/1795/5478)
/_All of_/ Institute of Soils, Chinese Academy of Sciences

HUANG Jung-chin (7806/2837/6855)
HAN Ping-sen (7281/3521/2773)
/_Both of_/ Commission of Comprehensive Surveys, Chinese Academy of Sciences. /_All five of the above are_/ coauthors of an article, "Saline Soil in Tibet and Its Improvement." (Peiping, T'u-jang, No 3, Jun 62, pp 12-20) (FOR OFFICIAL USE ONLY)

YANG Ching-chih (2799/2417/0037), researcher at the Institute of Geology and Paleontology, Chinese Academy of Science, and his assistant, TUNG Te-yuan (5516/1779/3293), collaborated in writing Chung-kuo te Ts'eng-kung-ch'ung /_Stromatopora in China_/, recently published by the Chinese Academy of Sciences Publishing House, one of a series of books entitled Chung-kuo Ko Men-lei Hua-shih (All of the Various Kinds of Fossils in China). (Peiping, Kuang-ming Jih-pao, 9 Jul 62, p 1)

YU Wen-jui (1429/2429/3843)
HUNG Ch'ing-wen (3163/1987/2429)
[Both of] Institute of Soils, Chinese Academy of Sciences, coauthors
of an article, "Preliminary Inquiries Into the Improvement of the
Saline Soil of the North China Plain Littoral by the Use of Well-
Drained Rice Paddies." (Peiping, T'u-jang, No 3, Jun 62, pp 31-40)
(FOR OFFICIAL USE ONLY)

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7 September 2004

Ms. Roberta Schoen
Deputy Director for Operations
Defense Technical Information Center
7725 John J. Kingman Road
Suite 0944
Ft. Belvoir, VA 22060

Dear Ms. Schoen:

In February of this year, DTIC provided the CIA Declassification Center with a referral list of CIA documents held in the DTIC library. This referral was a follow on to the list of National Intelligence Surveys provided earlier in the year.

We have completed a declassification review of the "Non-NIS" referral list and include the results of that review as Enclosure 1. Of the 220 documents identified in our declassification database, only three are classified. These three are in the Release in Part category and may be released to the public once specified portions of the documents are removed. Sanitization instructions for these documents are included with Enclosure 1.

In addition to the documents addressed in Enclosure 1, 14 other documents were unable to be identified. DTIC then provided the CDC with hard copies of these documents in April 2004 for declassification review. The results of this review are provided as Enclosure 2.

We at CIA greatly appreciate your cooperation in this matter. Should you have any questions concerning this letter and for coordination of any further developments, please contact Donald Black of this office at (703) 613-1415.

Sincerely,

Nancy Dotson for

Sergio N. Alcivar
Chief, CIA Declassification Center,
Declassification Review and Referral
Branch

Enclosures:
1. Declassification Review of CIA Documents at DTIC (with sanitization instructions for 3 documents)
2. Declassification Status of CIA Documents (hard copy) Referred by DTIC (with review processing sheets for each document)

Processing of OGA-Held CIA Documents

The following CIA documents located at DTIC were reviewed by CIA and declassification guidance has been provided.

OGA Doc ID	Job Num	Box	Fldr	Doc	Doc ID	Document Title	Pub Date	Pages	Decision	Proc Date
AD0335308	78-03117A	194	1	23	4363	Scientific Information Report Chemistry And Metallurgy (26)	3/7/1963	71	Approved For Release	3/25/2004
AD0335625	78-03117A	197	1	3	4460	Scientific Information Report Chemistry And Metallurgy (27)	4/4/1963	51	Approved For Release	3/25/2004
AD0336825	78-03117A	199	1	26	4562	Scientific Information Report Chemistry And Metallurgy (28)	5/9/1963	70	Approved For Release	3/25/2004
AD0332150	78-03117A	183	1	5	3916	Scientific Information Report Chinese Science (11)	10/4/1962	52	Approved For Release	3/29/2004
AD0332434	78-03117A	183	1	40	3951	Scientific Information Report Chinese Science (12)	10/19/1962	59	Approved For Release	3/29/2004
AD0332795	78-03117A	184	1	37	3988	Scientific Information Report Chinese Science (13)	11/5/1962	48	Approved For Release	3/29/2004
AD0333069	78-03117A	186	1	7	4028	Scientific Information Report Chinese Science (14)	11/16/1962	30	Approved For Release	3/29/2004
AD0333148	78-03117A	187	1	19	4078	Scientific Information Report Chinese Science (15)	11/29/1962	44	Approved For Release	3/29/2004
AD0333835	78-03117A	189	1	6	4144	Scientific Information Report Chinese Science (16)	12/21/1962	65	Approved For Release	3/29/2004
AD0334108	78-03117A	190	1	2	4179	Scientific Information Report Chinese Science (17)	1/10/1963	56	Approved For Release	3/29/2004
AD0334105	78-03117A	191	1	12	4230	Scientific Information Report Chinese Science (18)	1/18/1963	25	Approved For Release	3/29/2004
AD0334378	78-03117A	192	1	21	4277	Scientific Information Report Chinese Science (19)	2/1/1963	27	Approved For Release	3/29/2004
AD0334433	78-03117A	193	1	22	4322	Scientific Information Report Chinese Science (20)	2/15/1963	28	Approved For Release	3/29/2004
AD0335021	78-03117A	194	1	37	4377	Scientific Information Report Chinese Science (21)	3/8/1963	59	Approved For Release	3/29/2004
AD0335847	78-03117A	198	1	33	4526	Scientific Information Report Chinese Science (22)	4/18/1963	61	Approved For Release	3/29/2004
AD0336327	78-03117A	200	1	3	4578	Scientific Information Report Chinese Science (23)	5/2/1963	68	Approved For Release	3/29/2004
AD0337167	78-03117A	201	1	26	4643	Scientific Information Report Chinese Science (24)	5/23/1963	95	Approved For Release	3/29/2004
AD0337777	78-03117A	202	1	27	4687	Scientific Information Report Chinese Science (25)	6/6/1963	52	Approved For Release	3/29/2004
AD0338474	78-03117A	203	1	27	4727	Scientific Information Report Chinese Science (26)	6/20/1963	83	Approved For Release	3/29/2004
AD0338687	78-03117A	204	1	32	4772	Scientific Information Report Chinese Science (27)	7/5/1963	80	Approved For Release	3/29/2004
AD0339386	78-03117A	206	1	4	4820	Scientific Information Report Chinese Science (28)	7/17/1963	32	Approved For Release	3/29/2004
AD0339147	78-03117A	207	1	11	4862	Scientific Information Report Chinese Science (29)	7/30/1963	48	Approved For Release	3/29/2004
AD0340927	78-03117A	208	1	35	4924	Scientific Information Report Chinese Science (30)	8/21/1963	53	Approved For Release	3/29/2004
AD0341855	78-03117A	209	1	43	4974	Scientific Information Report Chinese Science (31)	9/5/1963	46	Approved For Release	3/29/2004
AD0342464	78-03117A	210	1	38	5013	Scientific Information Report Chinese Science (32)	9/16/1963	43	Approved For Release	3/29/2004
AD0342608	78-03117A	211	1	36	5054	Scientific Information Report Chinese Science (33)	9/27/1963	41	Approved For Release	3/29/2004